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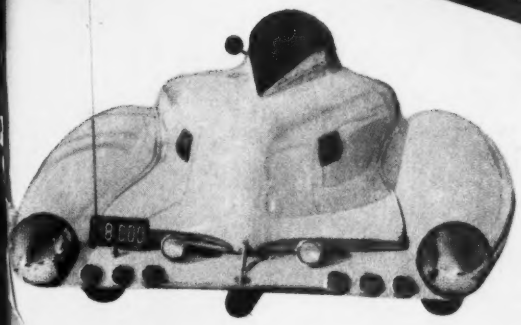
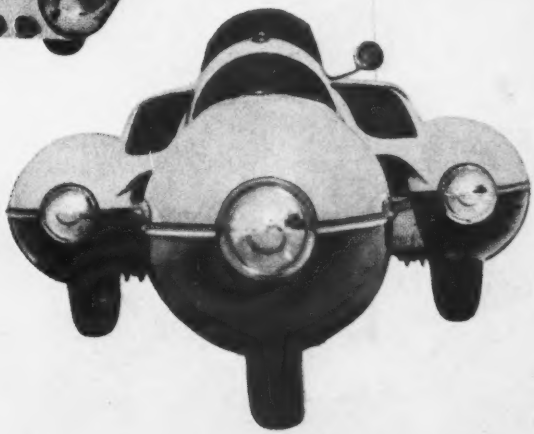


New hot rod has belly-tank body, wingtip-tank fenders, aircraft engine, does 110 mph—Page 84



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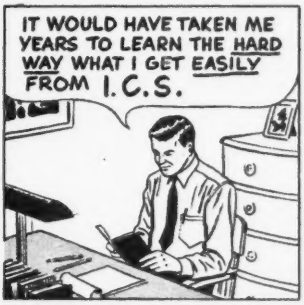
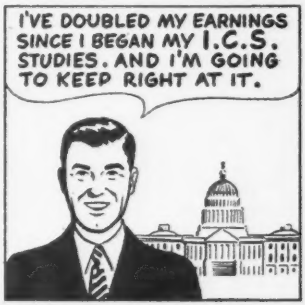


Studied with I. C. S. in my spare time . . .

I. C. S. sent reports to my employer . . .



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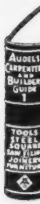

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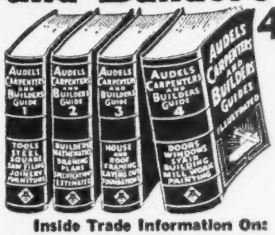

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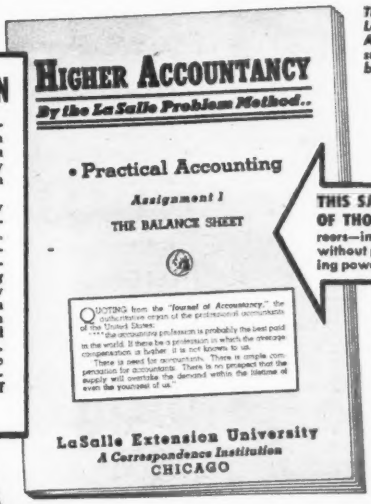

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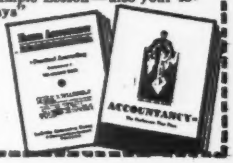

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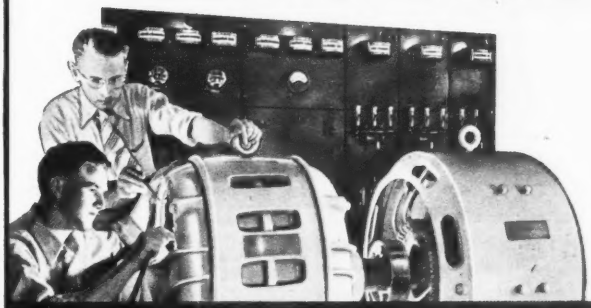

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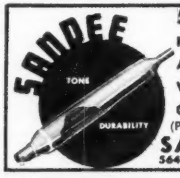

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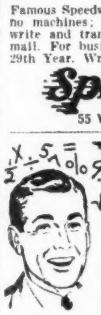

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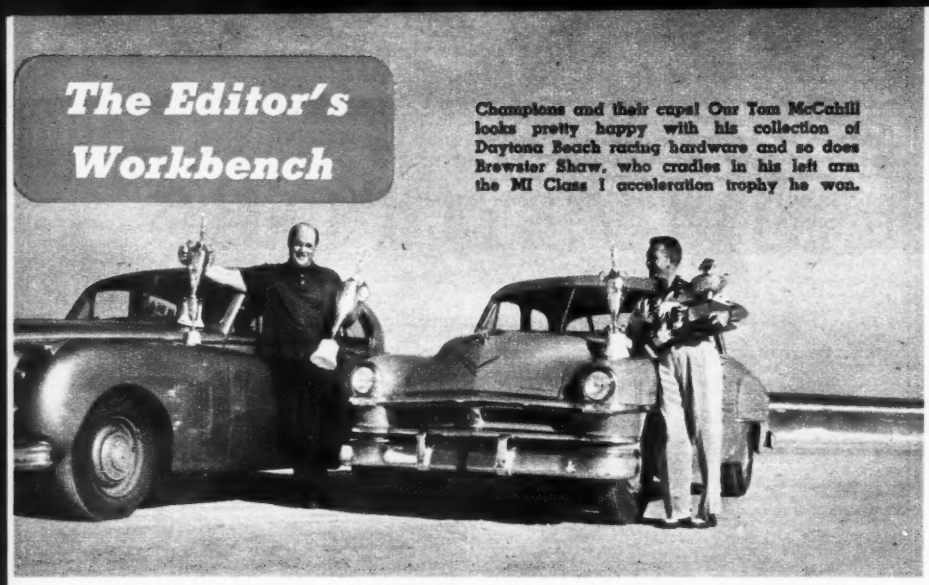
The Editor's Workbench



Champions and their cups! Our Tom McCahill looks pretty happy with his collection of Daytona Beach racing hardware and so does Brewster Shaw, who cradles in his left arm the MI Class I acceleration trophy he won.

MI's Acceleration Championships

The big scoop this month, chilluns, is the story of how that noted billiard top, Uncle Tom McCahill, brang home the bacon again by winning the speed trial championships at Daytona Beach. Last year, you will remember, Old Curlylocks became the first member of the NASCAR 100-Miles-An-Hour-Club by piloting a spanking new Chrysler New Yorker through the timed traps at a two-way average of 100.13, in doing which he won the national stock car speed trial championship for 1951. So now our Baldy has done it once more, this time with his silver bullet Mark VII Jaguar. With a two-mile build-up he got the Jag revving over the wet sands faster than a bridegroom's pulse and copped the title with an average speed of 100.94, or nearly a mile an hour faster than he did last year in the Chrysler. For details, see our lead yarn this month. A couple of days later, on the asphalt backstretch at Daytona, the strictly stock American cars gave out with the rpm's in the first competition for the MECHANIX ILLUSTRATED National Stock Car Acceleration Championship trophies (right), something brand-new we dreamed up for the NASCAR races this year and which we hope will become as popular as the flying mile event Uncle Tom won.

There were two divisions: Class I for cars with a piston displacement over 240 cubic inches, and Class II for those under 240. The object was to pick the fastest American stock car at one mile from a standing start, each car making one run with and one against the wind. In the big car class, Brewster Shaw copped the cup with his 1952 Chrysler Saratoga sedan, averaging 76.44 miles an hour to set a new American record for the standing-start mile, so far as we can discover. He went down in 46.73 seconds and back in 47.47!

In Class II, L. Merritt Brown of Daytona Beach won with his 1951 V8 Studebaker Commander sedan at an average speed of 70.60 mph.

Brewster Shaw, you may recall, is the courageous Chrysler dealer who loaned Tom his new, unbroken-in New Yorker sedan last year and saw Tom drive it to victory. This year, in the flying mile, Shaw ran second to Curlytop's Jag but won the American stock title.

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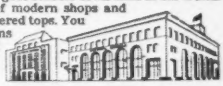

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Book Notes

AUTOMOBILE HISTORY SCRAPBOOK; Wigleswortb-Chastaine, Inc., 7134 Alhambra, Mission, Kansas; 160 pages; $1.50 (paper).

OF interest to every automobile owner is this collection of advertisements for and illustrations of vintage cars dating back as far as 1901. It displays the early work of over 85 manufacturers, most of whom are long-forgotten. At the turn of the century, these manufacturers didn't agree on power—some clung to steam and electricity, others moved on to gasoline. Cadillac made a popular and inexpensive single-cylinder model. Holsman advertised, "Air-cooled—no water to freeze; solid rubber tires—no pneumatics to collapse." Some of the pictured ancient autos seem surprisingly modern. The 1912 Pullman had an electric gear shift. The 1906 Northern had air brakes, an air clutch, and a steering-wheel gear shift. For everyone with a fondness for the good old days, this is a delightful and entertaining source book—*J. G. K.*

WOODWORK VISUALIZED by Ross C. Cramlet; Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.; 158 pages; $2.50 (paper).

ALTHOUGH the term "textbook" usually connotes pretty dull going, this volume is an outstanding exception; for despite the fact that it was written as a guide for vocational teachers, anyone who swings a hammer or brandishes a hand saw will find every page of interest. Not only is every important hand tool taken up in detail, but the sections on gluing, crack fillers, common joints, etc., are complete and thorough. The diagrams throughout are models of what explanatory drawing should be like.—*R. L.*

PRACTICAL TELEVISION ENGINEERING by Scott Helt; Murray Hill Books, Inc., 232 Madison Ave., New York 16; 708 pages; $7.50.

STUDENTS, engineers, and technical workers in the television field will appreciate this sound and detailed engineering treatment of the subject. It covers all components used in transmitting and receiving: lenses, lighting, oscillographs, generators, amplifiers, etc. Particular emphasis is placed on construction and performance.—*J. G. K.*

[*Continued on page* 164]

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Invention Clinic

JOSEPH H. KRAUS

Seed-Tape Planters

THE constantly increasing world population, coupled with the diminishing areas of land suitable for growing things and the continuous decrease in the total number of farmers, make it apparent that many things will have to be done if we are to have food sufficient for the ordinary processes of life.

Immediately needed is the development of new and better varieties of crops suitable for man and beast. Although the job of developing these largely will be left to the research scientist, the records will show that many a hobbyist has contributed to the field. However, the one respect in which the average inventor stands a good chance of demonstrating his ability is in the development of methods for making easier the tasks of the farmer. These entail easier planting, cultivating, harvesting and handling tools.

Take the matter of planting crops. The farmer either spreads the seeds by hand or by special machinery. When plants grown in rows have reached a certain size, there is the time-consuming process of thinning. This simply means that some of the plantlets which are crowded together are removed by hand. Often the remaining plants are again transplanted to new sites.

This is a backbreaking job which must be rushed to completion during a narrow margin of a limited season. It results in considerable destruction of plants as well. However, if the farmer could prepare his seeds beforehand, say during the winter, at spaced distances on a suitable tape, then roll the tape out on the ground or at a measured distance below the surface, much time would be saved and the operation of thinning and transplanting could be avoided. If the same tape could be impregnated so that it would contain a mold inhibitor and an insecticide, the usual losses to seedlings would be reduced.

Such a tape isn't impossible. A roll of paper which will disintegrate when left in moist soil for several weeks will do the trick. Nor is it essential that fertilizers be impregnated within the paper. Generally the seeds of the plants contain enough nourishment for growth until the roots are present in sufficient number to take over. The real problem comes in the production of a simple mechanism which will handle the seeds and insert them into the tape at a depth distance proper for correct growth and at the proper distance apart to minimize transplanting.

Spotting the seeds in the tape is no easy matter because of the great variation in shapes and sizes. Some seeds are nearly as small as ground pepper; others like lima beans are of considerable size; corn usually calls for a triple stand. The ideal depth of planting, with some variation, is about four times the diameter of the seed. Separation in rows may be from an inch to a couple of feet or more. This means that from an economy standpoint the tape must be relatively inexpensive. There is no sense to wasting tape footage or applying fertilizer where it will do no good.

Hence the problem really becomes one of developing a simple mechanism with which it would become possible to locate seeds of various sizes on a tape at easily adjustable distances both along the tape and from the surface. Also it is important that the planting of the tape be simple and quick.

The general idea of putting seeds into a cord or tape is not new. Examination of the files in the U. S. Patent Office will show that the situation was believed solved many times during the past 70 years or more. A review of these inventions may help mold your thoughts.

A paper wrap-around within which seeds are placed at intervals was protected by patent in 1879 by C. O. Wolferts of Hicksville, N. Y.

An eight-inch-thick mat of manure and

[*Continued on page* 18]

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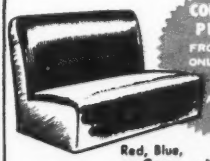

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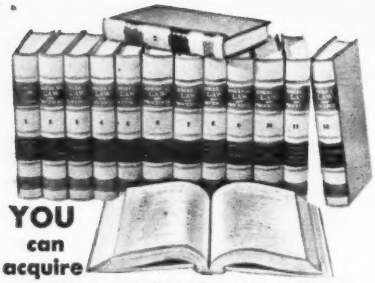

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Invention Clinic

[*Continued from page* 16]

straw with depressed pockets to hold the seeds was the method patented in 1894 by M. and P. Weber and Josef Perschl of Los Angeles, Calif.

Seeds were secured by gluing or cementing to a tape of almost any cross section according to the patent granted in 1898 to Isaac J. Jenkins of El Paso, Ill. The tape was to be in the form of a round cord or flat band of fabric or loose mesh made from linen, cotton, paper, wool or other desired substance.

Seeds prearranged on a large paper pattern in the form of a star, crescent, square, animal or other shape was the idea on which S. E. Gross of Chicago, Ill. received his patent in 1897. The seeds were to be held in position on the paper or cloth by a paste which also was to contain plant food.

Dormant Turf was the name given to a product patented in 1904 by Edward A. Kanst of Chicago, Ill. Its manufacture was to be similar to that of paper except that ground cow manure was to be used instead of wood chips. Seeds were to be floated on the surface during the manufacture, embedded by rolling, then the sheet was to be dried at 120 degrees F. to hold back germination.

A roll of paper or other material which would disintegrate in the ground was recommended in the patent granted in 1915 to William N. McComb of New York, N. Y. Small spots of mucilage, glue or other stickum was to hold the seeds sifted on the surface. Only those touching the tacky spots would adhere. Around each seed was to be an annular ring of poison bait, a ring of fertilizer or both.

The use of very thin tissue bands between which the seeds were to be secured, with a reinforcing thread running along the length of the band to increase its strength was outlined in a patent granted in 1915 to E. E. and D. E. Gray, respectively of Plano and Highland Park, Ill.

A multi-layer arrangement was outlined in the patent awarded in 1934 to V. E. Pratt of Plandome, N. Y. The dissolvable material was to be cotton or netting. On this was a layer of fertilizer, then a flexible plastic to prevent fertilizer acidity from affecting the seeds, then a layer of adhesive and finally the layer of seeds.

A mat to prevent erosion, to serve as insulation and to check weed growth, made from glass wool with a composition similar to lime bottle-glass, was outlined in a patent granted in 1940 to Games Slayter and John H. Thomas of Newark, Ohio. The mat was to contain seeds and/or fertilizer and would disintegrate after a time. The patent was assigned to the

[*Continued on page* 20]

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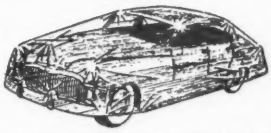

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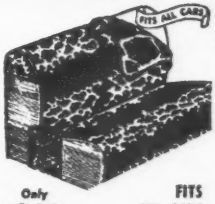

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INVENTORS

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PATRICK D. BEAVERS
Registered Patent Attorney
923 Columbian Building Washington 1, D. C.

Invention Clinic

[*Continued from page* 18]

Owen-Corning Fiberglas Corporation.

Several patents were granted to inventors for variations in the solubility of the tape. In one the tape is dissolved quickly, leaving the seeds surrounded by fertilizer; in another it lasts longer, the tape being planted edgewise which permits the distance to the upper edge to determine depth of planting; in a third a laminated sheet disintegrates slowly so that "heavy rains occurring before the seeds have had sufficient time to take root will not wash away."

A gelatinous moisture-absorbing cord in which the seeds are to be imbedded is specified in a patent in 1944.

A seed tape with which it should be easy to set the seeds at the right depth into the ground is outlined in another recent patent. In section this tape resembles the letter T. Seeds are located in the vertical arm, fertilizer and insecticides would be in the top horizontal legs. The tape is to be set into a slit trench in the ground.

Coated seeds have not been covered in this brief outline. Here the seeds are covered with a compacted soil-loam composition. Such pelletized seeds are of particular value when plantings from the air are to be made over rough or forested areas. A mechanism for the production of pelletized seeds is not yet available for use by the farmer or home owner. Some thought should be given to this

[*Continued on page* 29]

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
209 Columbian Building Washington 1, D. C.

INVENTORS

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Washington 4, D.C.

REGISTERED PATENT ATTORNEY
Patent Attorney & Adviser
U. S. NAVY DEPT. 1938-'47
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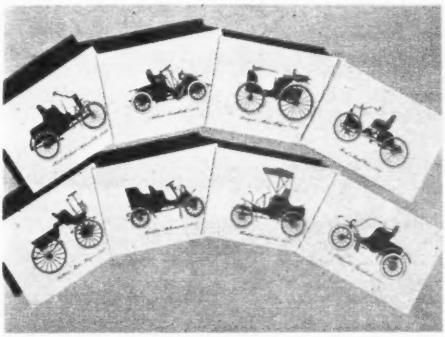
Early Automobile Prints



Collectors and hobbyists will delight in these color prints of the horseless carriage. There are eight studies of the cars of the late eighteen hundreds and early nineteen hundreds. Easily framed, they will offer a decorative scheme in the home. Creste-Andover Co., 62 East 87th St., N. Y. 28, N. Y.

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[Continued on page 25]

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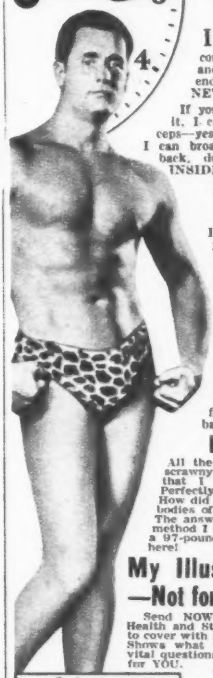
..and I'll prove I can make you a NEW MAN



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Dear Editor—

Use this letters column as you see fit—make it a complaint box, question box, suggestion box or even a soap box. But use it! Our only requirement is that you sign your name and keep 'em short, interesting and clean. Address mail to: MECHANIX ILLUSTRATED, Letters Editor, 67 West 44th Street, New York 36, N. Y.

Congressional Wind Power

Great idea Frank Tinsley has for converting wind energy into electrical power (Super-Windmills, March 1952 page 74). In line with the present drive for economy in the national government, I suggest that one of these windmills be set up in Congress to tap the enormous supply of wind generated there. Enough power can be obtained from this source to maintain electricity in all the federal buildings, thereby saving us taxpayers a lot of dough.

Arthur Calvin Gager
Milwaukee, Wisc.

Sounds great, a sort of blow-as-you-go plan. Might even be able to pick up enough hot air to heat the buildings, too.

B. M. W. Translated

Your March Pin-Up Car (page 90) caught my attention. What does B.M.W. stand for? British Man of War?

Bob Grothaus
Le Mars, Iowa

Bavarian Motor Works.

What's My Stone

Can any of your readers help me identify some stones I brought back from Superior, Ariz.? The natives call them Apache Tears; they look like large drops of smoky quartz and are found in perlite beds.

Zig Nash
No. Adams, Mass.

Uncle Sam Vs. Uncle Tom

I like cars better than women. And I like to write. I'm wondering if Tom McCahill needs a helper.

If Uncle Tom doesn't get me Uncle Sam will.

Don Laliberte
Camden, Me.

Sorry, soldier.

Monkey Business Answer

The answer to my monkey and banana problem which you printed in the March Dear Editor column is 79. The answers I am getting run about 33% correct.

Dr. J. C. Rivers
Mayfield, Ky.

The hundreds of answers we received here ran from 10 to 162—but a majority had it correct.

MI Strikes Out

You muffed one.

In the March issue of MI in Hobby Hall of Fame (page 104), there was a picture of Joe E. Brown holding the bat with which Babe Ruth set the record of 60 home runs. You said the year was 1931. Well, Babe set the record in 1927. In 1931 he hit only 46 home runs.

Bob Koch
Ashland, Pa.

Looking Backward

According to Do Cycles Rule Your Life? (March 1952 MI page 59) we can expect that bustles will be back in 1970. Well, Hallelujah, I'm waiting till the fashion cycle gets back to Garden of Eden styles.

Adlai K. Lowen
Bloomington, Ind.

Schmoo's Who

Zoo's Who (March 1952, page 100) was an extremely interesting story. I loved reading about the quetzals, bandicoots and tuataras. But there's one very rare animal you left out —the schmoo.

Izak John Lafferty
Hartford, Conn.

We considered including the schmoo but found it to be extinct, killed off by a bad case of commercialization.

[*Continued on page* 24]

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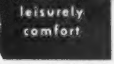

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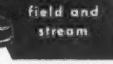

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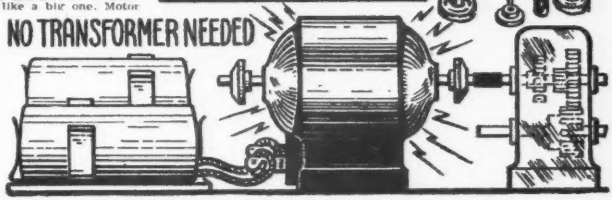

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MAIL COUPON NOW

Dear Editor—

[*Continued from page 22*]

In Defence of Detroit

Don't you think it's time somebody defended American automobiles? I will make just three statements:

1. I'd rather have a car that looks like a bathtub (they're rather comfy on Saturday night, you know), than one which looks like a cut down version of the crate the tub came in.
2. My Olds Rocket will beat a Jaguar from 0 to 60 and from there on I don't care.
3. Cadillac, Oldsmobile and Chrysler make the finest stock car engines built today.

Ralph G. Crum
Carnegie Inst. of Tech.
Pittsburgh, Pa.

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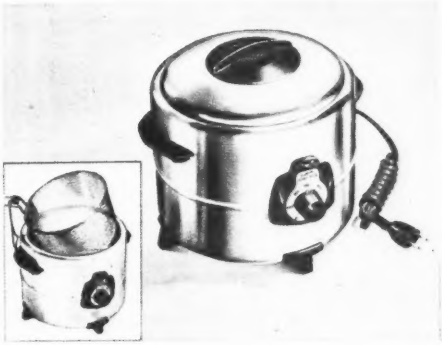
"Of course the gasoline companies don't like it—but you can't please everyone."

MIscellany

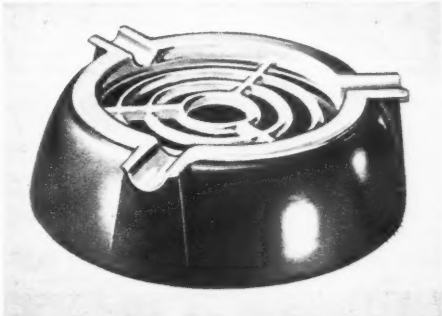
continued from page 21

French Fryer



For those who enjoy French fried foods, but hate the muss that generally goes with this type of cooking, the Burpee utensil will be a boon. It is fully automatic and comes supplied with an adjustable thermostatic temperature control and a pilot light that tells when the oil is ready for use. The no-drip frying basket keeps particles of food from dropping into the cooking well. Burpee Co., Barrington, Illinois.

Spillproof Ashtray



Unsightly ashes scattered over office desks or coffee tables are eliminated by this five-inch windproof ashtray that is equipped with a special deflector grill that prevents blowing and also provides a screen that hides butts. Edw. A. Grossfeld, 225 N. Michigan Avenue, Chicago 1, Ill.

[Continued on page 31]

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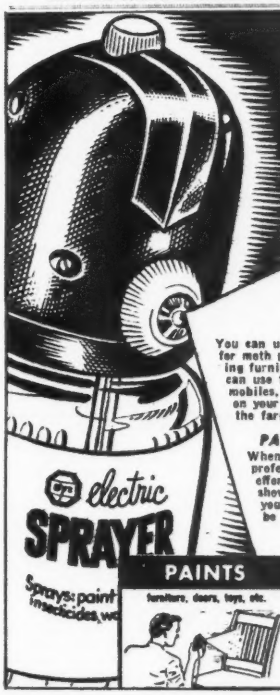

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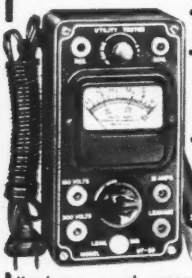

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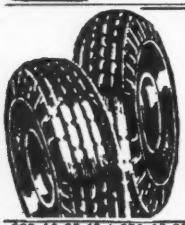

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Invention Clinic

[*Continued from page 20*]

as a possibility. Many modifications could be developed by the inventor. A simple system giving speedy results would be of considerable value as it may be more economical than the use of seed tapes especially where plantings are widely spread.

A further possibility for development is some method for cutting the tape into short lengths, each with its own seed, then planting the sections by suitable inserting machinery.

It is important that some study be given to both the theory and economics of the treatment. The fact that there are many patents devoted to this topic should make you think twice before rushing to the Patent Office with just another idea.

An easy study would be possible by purchasing several packages of seeds of all sizes and shapes. A good sample would take in lima beans, corn, peas, cosmos, marigold, lettuce, pansy and petunia. Now see if you can devise some system which will handle all of these so that only one seed at a time can be set into the ground at a depth of four times its diameter and at variable distances in the row.

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MIscellany

continued from page 25

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[Continued on page 33]

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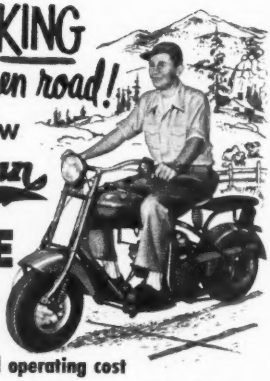

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MIscellany

continued from page 31

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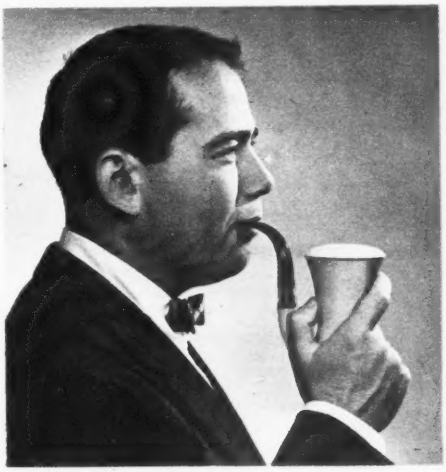

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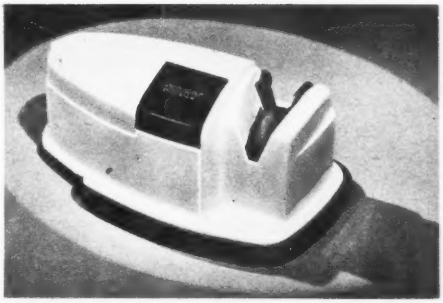

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[*Continued on page 37*]

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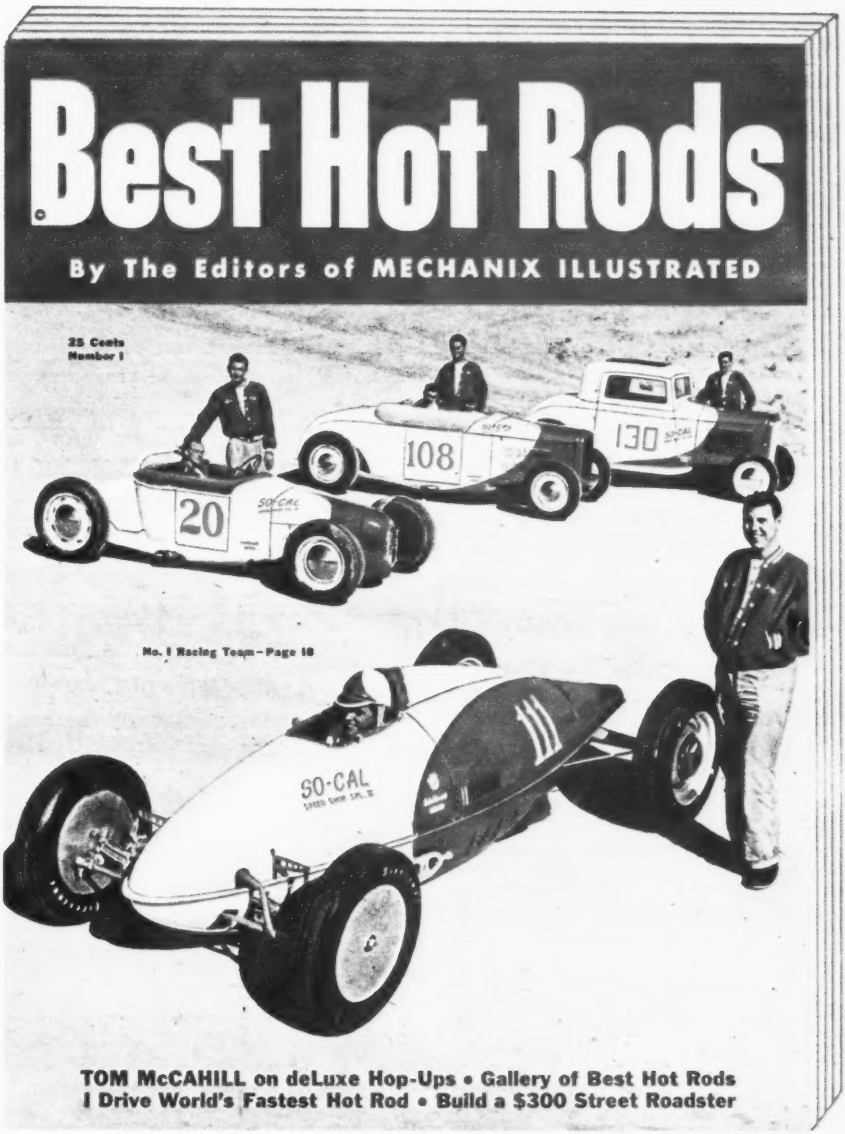

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LOOK ON PAGE 45

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continued from page 3

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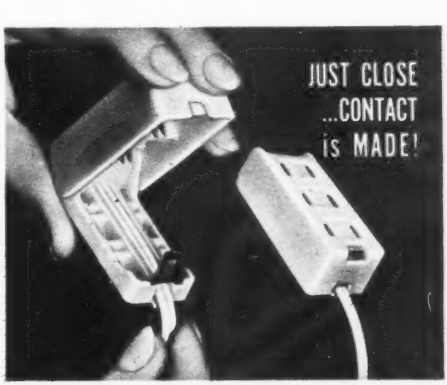

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[*Continued on page 39*]

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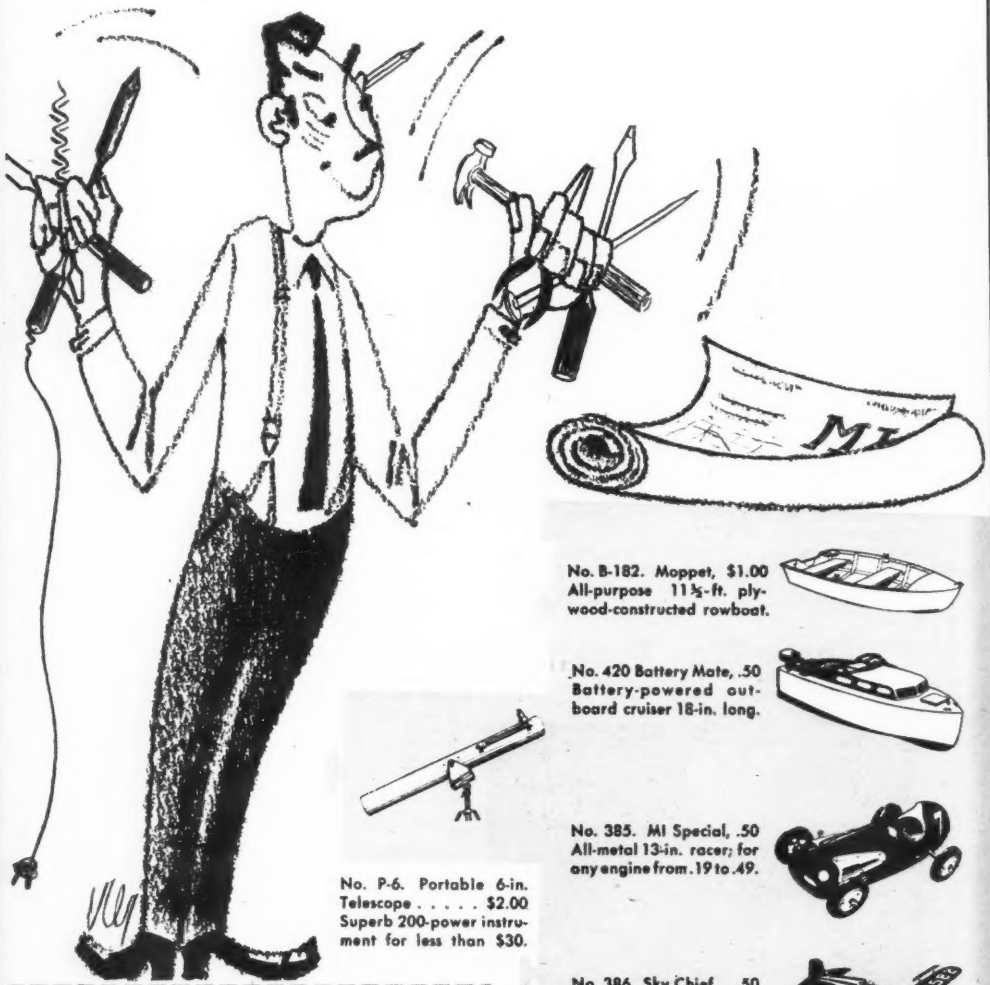

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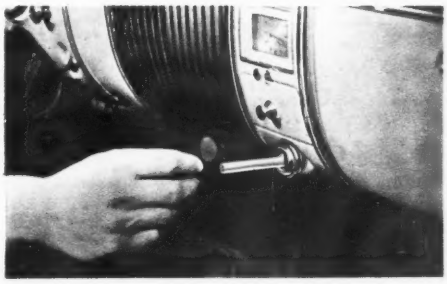
MIscellany

continued from page 37

Automatic Lighter



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[Continued on page 43]

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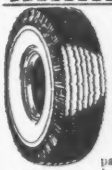

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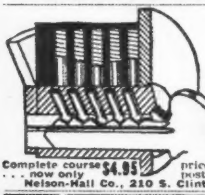

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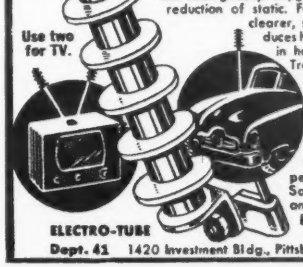

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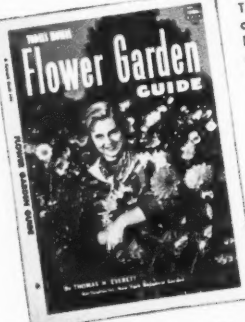

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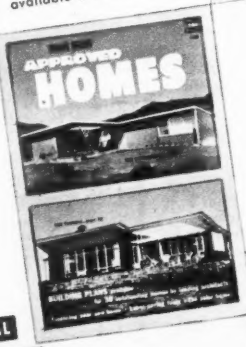

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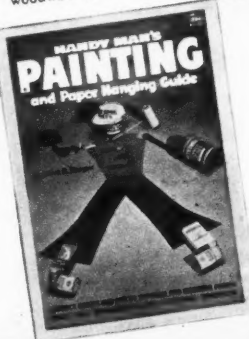

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continued from page 39

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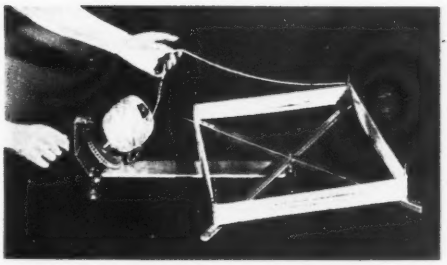

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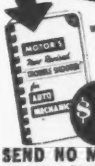

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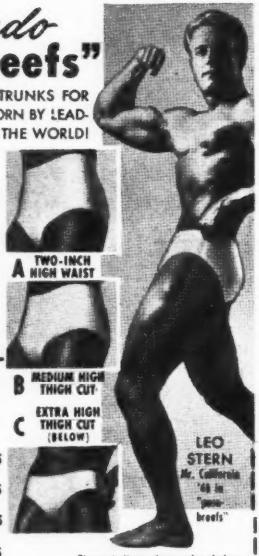

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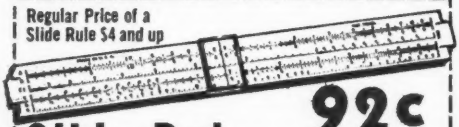

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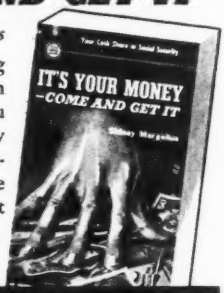

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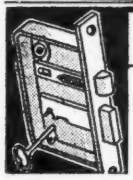

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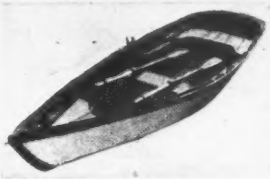

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McCahill Sets World's Speed Record

Repeating his 1951 victory, Uncle Tom wins again at Daytona Beach, hanging up a new mark for stock sedans with his Jaguar.

Bill France, NASCAR proxy, hands Tom the International trophy he won.

THE story of how my Mark VII Jaguar set a new world's record for stock sedans at Daytona Beach last February really starts several months before and about 1,000 crow-fly miles removed from the scene of the crime. The time: a rainy, black midnight. The place: a slick, high-crowned macadam road somewhere between South Bend and Detroit.

In the Detroit hack I then owned, my wife and I were making a fast swing around the auto factory circuit. On this particularly wet midnight we were bowling along at close to 80 when out of the darkness a

On his fastest run through the one-mile trap, Tom and his Jag averaged 102.56 miles an hour.

hard turn loomed up ahead. I cut in close to the inside corner and my big-tailed car started to waddle like Donald Duck. After considerable heart-swallowing and physical activity I made the turn—but I was the unhappiest bald-headed night crawler on the highway.

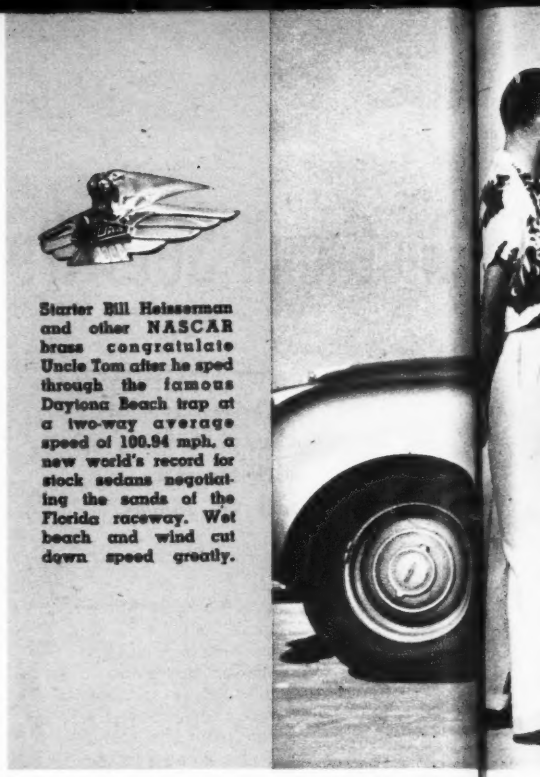
It was about the third time on the trip that I had had a close call due to nothing other than lack of roadability. I was fed up. I told my wife right then that if we ever got home in one piece I was going to trade this rig in for something with a little balance. A few weeks earlier at the Convair races, John Fitch, the noted sports car driver, had told me that his new Mark VII Jaguar was his idea of the perfect high-speed, full-sized cruising car. As I had an assignment from MI to do a test piece on the Mark VII, I started thinking about owning one.

So, several days after that close shave on the South Bend-Detroit pike, I went around to Max Hoffman's glamorous imported car showroom on Park Avenue in New York City to give the Jag a closer look. The trunk space was bigger than the one in the car I then owned, the seats and all appointments were far superior to anything that has emerged from Detroit for many years, and—well, I made a deal with Max to dispose of my old car, gave him a check and bought the silver-gray Mark VII sedan right off the showroom floor without even so much as a ride around the block.

It didn't take long to convince me that on the open highway the Jaguar handles like a sports car and will out-corner and out-maneuver any full-sized American car ever made, bar none. It holds the road like a miser hanging on to his last buck. The steering qualities are magnificent and the adjustable steering wheel and two-way adjustable seats make it easier to stay with, and less tiring, for hours at a stretch, than any car we have. It also rides better than any Detroit product I have ever tested.

I discovered quite a few weak points, which we will come to anon, but lack of speed was not one of them. This little lady was, as the sports car crowd likes to say, a quick Jag. It wasn't long after I bought her that I started thinking seriously about taking a crack at Bill France's NASCAR speed trial championships in Florida, which I had won the previous year in a 1951 V8 Chrysler New Yorker with a two-way average of 100.13 mph.

I had been in Florida less than two days before I realized that the foreign car crowd had marked the Mark VII as just too slow in the pick-up department. This car,



Starter Bill Heisserman and other NASCAR brass congratulate Uncle Tom after he sped through the famous Daytona Beach trap at a two-way average speed of 100.94 mph, a new world's record for stock sedans negotiating the sands of the Florida raceway. Wet beach and wind cut down speed greatly.

weighing 3,850 pounds dry (same as a Chrysler V8 Saratoga), with an engine actually as small as a Plymouth's, didn't have the getaway punch some of these boys admire. I talked this over with George Forman, Palm Beach Foreign Motors service manager and about the best Jag man in the country, and he told me that with dual exhausts the improvement was miraculous. He also recommended installing the optional, factory-supplied, high-lift cams. I was afraid they would affect the idling but to my amazement the car idled better than ever after the cams were installed. Next, we put on the dual exhausts—and this did it! (Why the factory made the old Mark IV Jaguar with dual exhausts and then installed the XK 120 race engine in the Mark VII, only to choke it up with single muffler and small pipe, will always be a mystery to me.) Now I was creaming the Chrysler V8's in drag races and on a measured mile I was clocking close to 112 mph actual. No stock Chrysler or Cadillac ever built could stay with me.

The big rub came when I turned down Tommy Thompson's kind offer to run his Chrysler Saratoga in the Daytona Beach speed trial championships and elected to run my Mark VII in the International Open strictly stock sedan class. There is optional

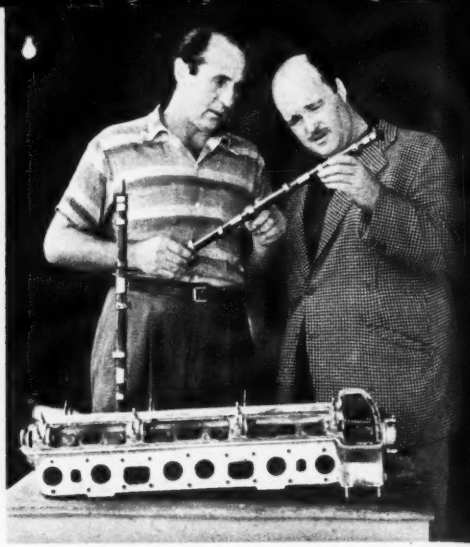
dual exhaust equipment for the XK 120 but none for the Mark VII, even though it uses the same engine! So off came my Forman-installed exhaust system and back went the piddling Mark VII pipe for the speed trials. My pick-up fell off and so did my top speed. I could no longer cream the Chryslers in drag races and I wasn't too sure of my top speed.

George Forman and George Schrafft, owner of Palm Beach Foreign Motors, came to Daytona to give me a hand in tuning up. We tried retiming and every other known tune-up trick but could not get the car back to its dual exhaust time. When the day of the trials arrived, on February 5, we frankly didn't know whether we could take the Chrysler Saratoga and the Hudsons or not. The build-up run before entering the traps had been shortened to two miles this year and, with this high speed but small engine on very sticky wet sand (about six miles an hour slower than a regular concrete highway), we felt the Chryslers, with their tremendous initial torque, would be able to overcome the beach drag better than we.

Our strategy was to wind up the Jaguar to 5500 in all gears so that I would have the entire 160 horsepower output to work with. When I got the green flag I screamed to 5500 in the first three gears. I was rolling at better than 80 when I power-slammed into high (fourth gear). The car was still building rpms when I hit the one-mile trap and was still building up when I came out. I had 40 pounds of air in the tires and as there was about a 25-mile wind blowing (duplicating last year's conditions exactly) the car got very light-footed up front though it was still under full control.

When I completed the run some five miles later, at the other end, I was told by the sheriff that Bill France had radioed down that I hadn't tripped the trap and was to go right back and do it over again. The course would be held open for my return. I took the seven-mile run at 70 to cool the engine. Then it happened. A Florida Highway Patrol car followed me the last mile up the beach to where I stopped at the starting line. For five minutes the most discourteous jerk in the uniform of a highway patrolman sounded off about my "daring" to run up the course. He hadn't heard the radio orders and, taking advantage of a gathering crowd, told me he would knock some sense into my head. Fifty feet away, Bill France, the NASCAR prexy who had given the order, sat in his car not knowing what was going on. I told John Law that if he checked with France he could find out

George Forman, one of America's best Jaguar men, consults with Tom as they ready the car for racing.



Tom and Forman look over the optional high-lift camshaft which vastly helped Jag's performance.

about the order but he was really warming up by now and he said he didn't give a damn who gave the order—he didn't believe me anyway.

While this stupid harangue was going on, the Jag was getting hot as a pistol after the long, hard wide-open throttle run with a choked exhaust (which causes excessive heat at these speeds), the drag of the sand and now the slow idle. When I took to the line again the engine was a lot too warm for best performance. This time she was slower in building up, due to heat, and I was a good 200 rpm (about four mph) off my former speed when I came through the trap. I made the down run in 35.10 seconds (102.56 mph). Brewster Shaw in the fastest Chrysler (with a 3.36 optional rear axle gear) had registered 102.88 for his with-the-wind run. I had almost one-third of a mile an hour to make up in the run against the wind. On the way back the Chrysler, against the hard wind, did 97.29 mph.

It was now my turn. I wound the Jag up through gears so it sounded like a siren and was indicating 5200 rpm or just over 100 mph. At the end of this run I was again told that I hadn't tripped the wire and had to go back and do it once more! This meant another five miles of wide-open throttle work gone to waste, plus the seven-mile runback. The Jag was still hot but again I took it up at open throttle. This time when I went through the traps I was showing 5150 rpm. When I finished I was told that my time had been 36.25 seconds, or 99.31 miles per hour. Some quick calculation showed that I had beaten my closest rival for the International trophy, the Saratoga Chrysler, by over three-fourths of a mile per hour in spite of brushing with the Florida law and twice failing to trip the trap.

This means that the Mark VII Jag with an average speed of 100.94 set a new world's record for stock sedans on the beach and not only collected the International Unlimited trophy but the foreign sedan trophy as well. Brewster Shaw's time with the Saratoga won the American stock car championship at a speed of 100.09. Three

"A great feature," says Tom of the sliding roof which even in torrential rain proved leak-proof.

Twin gas tanks (lids open) are standard on the Mark VII Jaguar in which McCahill set his record.

days later, at the MECHANIX ILLUSTRATED one mile standing-start trophy trials, Shaw and the same Saratoga Chrysler, having changed gears and now using an optional 3.73, set a new American stock car record for the standing-start mile in Class I (over 240 cubic-inch displacement) by averaging 76.44 on the two-way test. My Mark VII Jag took the foreign car class by beating Court Colver's XK 120 hardtop coupe at an average of 75.15.

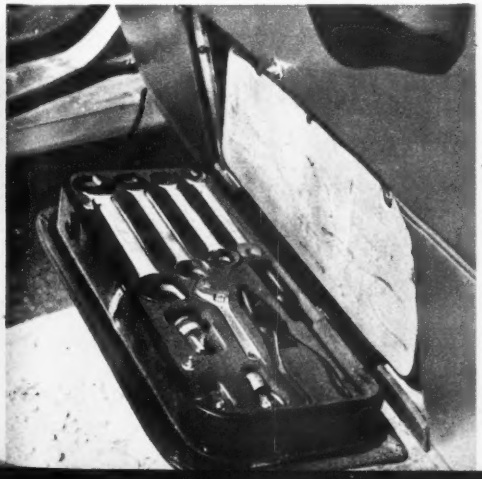
It was in these acceleration trials that I missed my dual exhaust most. Also, though not competing directly against the Jag, the fact that the Chrysler made faster time in the one-mile standing start is not a true comparative picture of both cars in this event because if I had used two other axle assemblies (which are available to the Jag, too), I might not only have gotten down the beach faster in the flying mile but most certainly would have made considerably higher speed in the standing-start trials. My Jaguar made all runs with the gear that was in it when I bought it off Max Hoffman's showroom floor.

The Mark VII Jaguar is in direct price competition with our Cadillacs and Imperial Chryslers. How does it come off? Frankly, it takes some and has to give some. The accessories on American cars, such as heaters and even windshield wipers, are far superior to the imported Jaguar's and so are the radios, defrosting equipment and fan belts. The big difference, however, is in the noise and temperamental disposition of the beast.

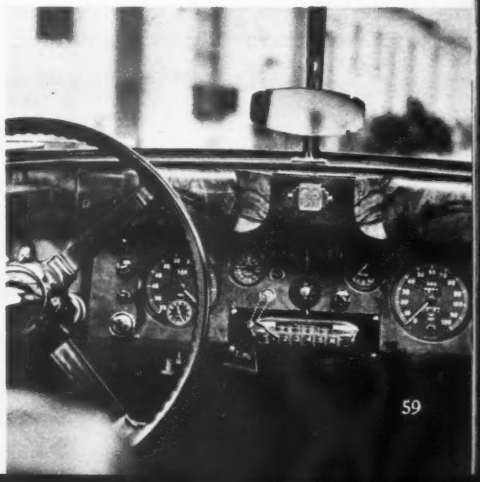
The Mark VII has the XK 120 Jaguar double overhead-cam, six-cylinder engine that is a pure masterpiece of design but inclined to be noisy by American standards. The man who has owned Cadillacs for years will find it more than a little tough to sell his wife on that rurr-rurr sound while the car is idling, caused by the overhead cams (after the 500-mile service, the noise will be cut in half). All she will remember is that her beloved Caddie purred like a kitten from the first mile.

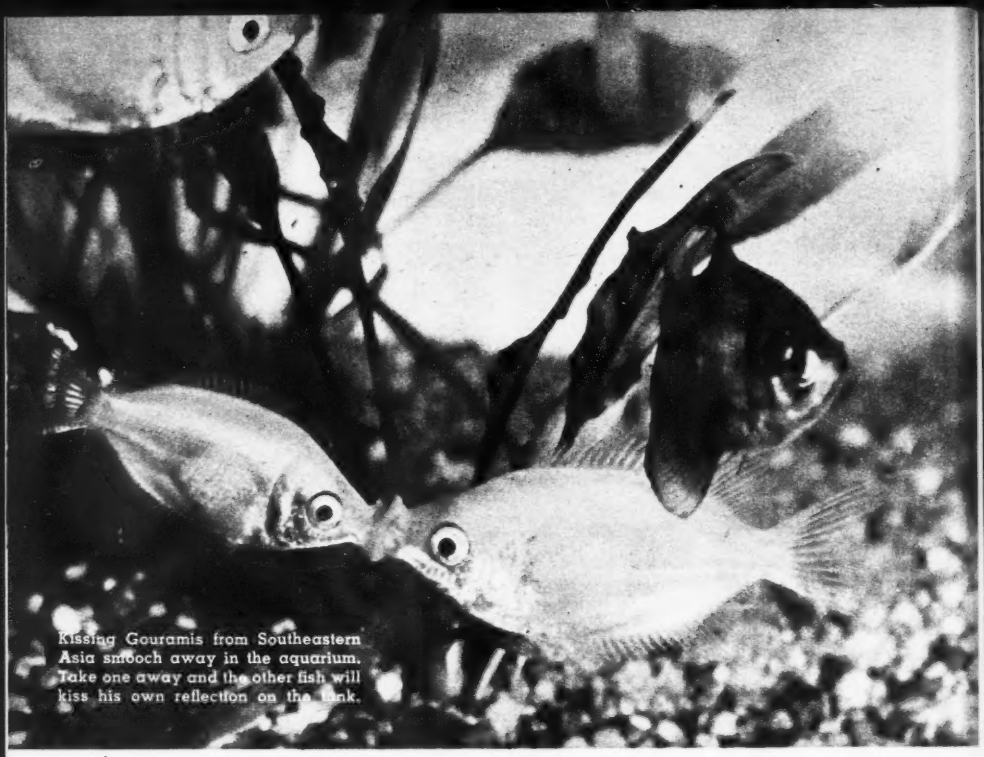
He will miss the tremendous torque and pick-up when he tramps on the throttle in high gear at low speeds. This is a car to be paddled up through the gears, especially when it is new [*Continued on page* 168]

Cleverly recessed into one of the doors is this set of tools and spare bulbs, another Jag feature.



A tachometer for counting engine revolutions (dial behind wheel) is regular equipment on the Jaguar.





Kissing Gouramis from Southeastern Asia smooch away in the aquarium. Take one away and the other fish will kiss his own reflection on the tank.

Tropicals are Topical

AT the end of the telephone conversation, the Chicago broker was chalk-faced and trembling. "Cancel my appointments for the rest of the day," he told his secretary. "I've got to go home immediately."

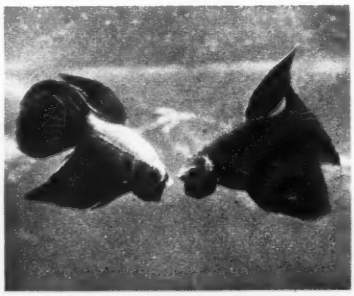
"Is there something wrong?" the young woman asked.

"Sickness in the family, and darn serious. My Pompadours and Cambodia Bettas are suffering from the ich!"

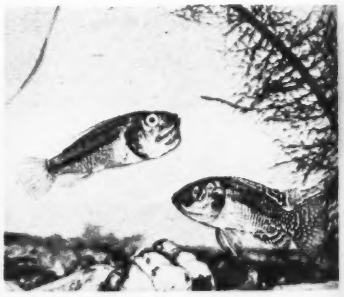
Jamming on his hat and coat, the broker dashed from the office while the secretary was still trying to figure out the nature of the plague which had struck his household.

Had she been one of the 12,000,000 tropical fish fanciers in the United States, she

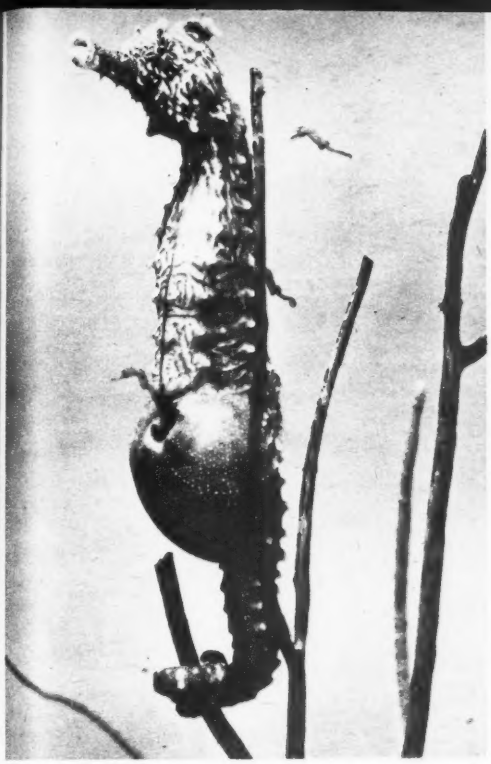
All you need is a fish tank and some Guppies to start in one of the world's most amazing hobbies.



Male Bettas are the fightingest small tropical fish in captivity.



African Mouthbreeders hold fertilized eggs in mouth till hatched.



Unusual photo shows birth of sea horse. Female deposits eggs in brood pouch of male and after several weeks, young sea horses are expelled with labor pains by father. Sea horse shown here gave birth to about 350 young in one hour.

By West F. Peterson

would have understood immediately. Bettas and Pompadours are species of aquarium pets; the Pompadours in particular are rare and cost about $75 a pair. Ich is a disease that afflicts tropicals.

The deep concern of the broker marked him as being in the most advanced stage of hobbyitis. Yet any ardent aquarium fan would sympathize with him. He'd become strongly attached to these residents of his tanks, just as other men develop a fondness for dogs or horses.

By modern methods of treatment—and ailing fish are even given aureomycin these days—the broker was happily able to save his precious Pompadours and Bettas and return to work with an easy mind.

The Chicagoan, like a great many collectors, took up his indoor sport on the advice of a physician. Doctors claim there's nothing better for quieting the nerves.

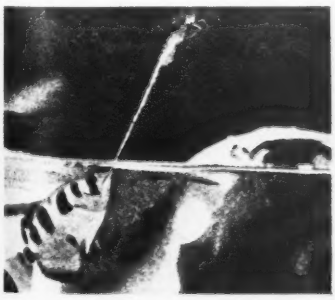
If you have the jitters over taxes, inflation and the atom bomb maybe you, too, need a tank full of tropical fish. Watching them cavort in their own little world provides the same relaxation that comes from staring at an open fire. And it's fun in the bargain.

You can start your collecting on the smallest possible scale by buying a few Guppies and a small glass bowl. The next step is to obtain several varieties of fish, a regular aquarium, sand for the bottom and aquatic plants—total cost, from $10 to $200. From there, the sky's the limit.

If you go all-out for the finny pets, you may become as much of a nut as a certain Wall Street tycoon. This dignified individual is the best customer of the Aquarium Stock Company of New York and Los Angeles. Almost every week he comes into the Manhattan store and plunks down no less than a couple of hundred dollars for the rarest species, thermostats, pumps and other gadgets to keep his fish happy.

Such a wealthy aquarist may have as many as 20 or 30 tanks of his own and constantly tries out the newest equipment on them. More than that, he makes it a practice to buy tanks and fish to give to friends and relatives.

But you don't have to be rich to be a collector. The Wall Streeter does his shopping alongside youngsters from Chinatown who break open their piggy banks to purchase



Archer Fish spits out a stream of water to catch insect food.

Siamese-twin Mollies were more valuable than ordinary ones.

Angel Fish is popularity queen among tropical fish fanciers.

such items as a pair of Angel Fish for 98 cents.

The keeping of tropical fish is the nation's biggest-booming hobby right now. Fanciers spend upwards of $60,000,000 every year for pets and equipment. Business of the Aquarium Stock Company—largest, but only one of hundreds of dealers—has more than doubled in the past two years, according to Louis Dalwin, a partner in the firm.

"Our busiest season is the week between Christmas and New Year's," says Dalwin. "Lots of people like to blow their year-end bonus on tropicals."

Far from being confined to this country, the hobby is world-wide. New oil millionaires of Venezuela, like their counterparts in Texas, have become enthusiastic collectors. King Farouk heads up the fish fanciers of Egypt. His Excellency Rajah Maharajah Singh, governor of Bombay and many other Indian potentates find enjoyment in spying on the underwater gems. Italy, England, Germany, China, South Africa, Thailand—almost any country you can mention has its devotees.

When a Winnipeg department store put on a tropical fish show recently there were 125,000 interested visitors. The vivid tropicals have been used in ads to help sell beer and cigarettes. They have also appeared as supporting actors on the TV shows of Paul Whiteman, Ed Wynn, and Private Eye Martin Kane.

Joe DiMaggio became a collector not long ago. Walter S. Gifford, U. S. ambassador to London, is a fan. Producer Billy Rose spent thousands for an elaborate layout. Theater folk like Shirley Temple, Victory Jory, Gary Moore and Bing Crosby's brother Everett enjoy the hobby.

One of the advantages of keeping fish is that the whole family can enjoy them. Housewives—once they get accustomed to keeping containers of worm food in the refrigerator—are as enthusiastic as their husbands. The children, of course, are utterly fascinated.

Tropicals have other advantages, as pointed out in the Aquarium Stock Company catalogue:

"Fish are the cleanest of all pets—no odor, no dirt. We have yet to hear of a landlord who forbids the keeping of an aquarium in his apartments. Tropical fish do not have to be walked every day, nor let out each night; they don't misbehave while you're away, and if you want to go on a two-week vacation they will do perfectly well without a bit of care during that time."

Accessories form a large part of the Aquarium Stock Co. business, top. Wife of the president of the company, above, displays a new picture-frame aquarium which sells complete for $144.

Fish serve admirably to teach youngsters the facts of life, especially those classified as live-bearers whose mating and breeding follow the human pattern. Watching the fish produce their young causes more excitement in an aquarium-equipped home than a television showing of a World Series game.

The live-bearers—Platys, Swordtails, Guppies and Mollies—are the easiest to breed in an aquarium and for that reason they are the favorites of beginning collectors. Most prolific of all are the Guppies—but precautions must be taken with the tiny offspring to keep them falling prey to cannibalism.

Egg-bearers include the Bettas, Paradise Fish, Gouramis, Cichlids, Panchax, Danios, Rasbora and Tetras. Some deposit their spawn in the sand at the bottom of a tank or among the underwater plants. Others build nests of bubbles on the surface in

Redwood wall aquarium was designed and built by artist Fred Joeger. Hinged slabs of bark decorated with orchids and ferns, above, hide tanks and equipment, below. Ports in bark allow glimpses of fish.

which the eggs are placed.

The bubble-nest technique is well worth observing. When a female Betta, for instance, is about to spawn, the male starts his construction work. He comes to the surface, gulps in air and expels a bubble coated with a sticky excretion from his mouth. He does this hundreds of times, until there is a cluster of bubbles some three inches wide.

Male and female then get together beneath the nest and the eggs are expelled and fertilized. The male carries the eggs to the surface in his mouth and deposits them in the mass of bubbles. Mrs. B. is taken from the tank because of her unmotherly tendency to eat the eggs and hubby then stands guard for a period of from 48 to 72 hours. If any of the eggs fall out of the nest in this time he picks them up and replaces them.

At the end of [*Continued on page* 166]

There are Still NEW WORLDS TO

CONQUER

DESPITE 2,000 YEARS OF CONSTANT PRYING BY ADVENTURERS, THERE ARE VAST AREAS OF UNCHARTED FRONTIERS STILL REMAINING ON THE GLOBE.

By Lester David

PRESSES were just beginning to roll on a new map of the Western Hemisphere recently when the telephone jangled in the American Geographical Society's cartography department.

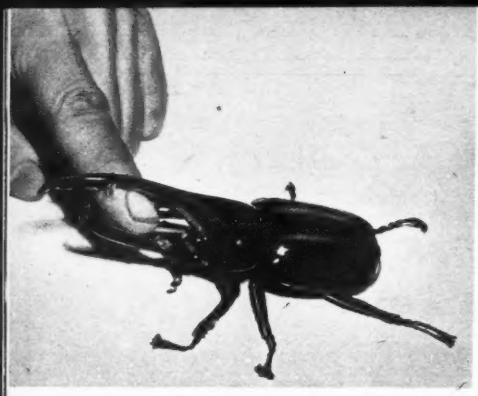
"Hold everything!" an excited voice called. "We've just found three islands we never knew about!"

Plates were yanked off the presses and the map makers went to work charting the new discoveries after the information was relayed to them by the Arctic Institute of North America. It seems that Army pilots on a reconnaissance mission in northern Canada had blinked and gaped at the sight of three chunks of land in Foxe Basin, on the west and southwest sides of Baffin Island. The islands were not marked on the flight maps—in fact, no one had ever known they existed.

Amazingly, these islands were no mere dots in the sea. The largest, oval in shape, was a full 60 miles long. Yet they lay undiscovered in the Western Hemisphere until the planes accidentally droned over them!

Did you think that this world of ours is fully explored, that we know everything about our lands and seas, that there are no frontiers left for the young pioneer to explore? Well, guess again, because the startling fact is just this: Despite 2,000 years of constant probing and prying by the world's adventurers, the extent of unexplored land left on the globe today staggers the imagination. Few people realize just how vast are the still uncharted frontiers of this earth, just how much land and sea exists which man has not yet penetrated nor even seen.

Scientists and statesmen are just beginning to realize the immense importance of solving the geographical riddles which re-



Hercules beetles, larger than field mice and equipped with huge jaw-like pincers, were found in the almost impenetrable jungles of Venezuela.

Plagues of locusts devestate all vegetation in a 30-mile area of remote part of the Far East. This unusual picture was taken at Rawlpindi, India.

Hostile natives and jungle hardships await pioneers to the Amazon basin in South America. But untapped rubber resources are a strong incentive.

main, for the significance of new finds to national security cannot be underestimated. At a time when countries are scrambling to strengthen their economic and military resources, the conquest of new areas can provide limitless raw materials and strategic military, naval and air bases.

Just what areas still remain for the daring young Columbus' of the 20th century?

Pioneer journeys in the fullest meaning of the term can still be made in Central Africa, Central Asia, South and Central America, Australasia, Indonesia and the polar regions, There are blanks on the maps of Columbia, Venezuela, Brazil, Arabia, Tibet, New Guinea, Borneo and, of course, in the Arctic and Antarctic. The great forested areas of the Amazon basin and the Congo, the vast desert regions of Australia, the mighty mountain ranges of the Andes and the Himalayas are not fully explored.

Antarctica? Why, we don't even know the shape of that immense polar continent. Perhaps the greatest explorer's journey of all time still remains to be made—that's the crossing of the Antarctic continent from sea to sea by way of the South Pole. The man who makes it will go down in history alongside the top globe-girdling adventurers of all time.

A few months ago, a terse radio message was received at the offices of the American Geographical Society. Charles B. Hitchcock, executive secretary, tore it open excitedly. It contained this brief phrase: "Greetings from the headwaters of the Orinoco."

That sentence transformed the staid society's offices into a bedlam. It meant that one of the most primitive areas on earth had been conquered at last. It meant that explorers for the first time in history had vanquished towering mountains, dense rain, forests and plagues of insects to reach the headwaters of the mighty Orinoco River in South America.

The message came from Dr. Jose M. Cruxent, director of the Museum of National Sciences in Caracas, Venezuela. It was sent by a portable transmitter in the stone-age interior of the fevered Venezuela jungles, where Dr. Cruxent had led an expedition up the raging Orinoco to a region never before penetrated by white men.

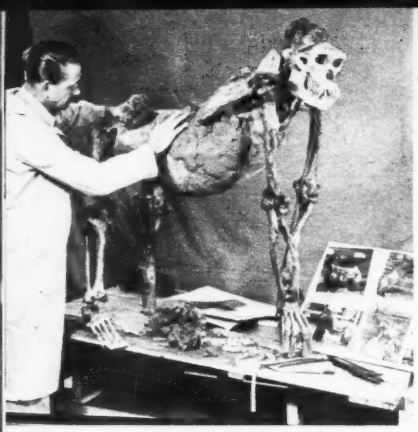
Dr. Cruxent and his party hacked their way for months through wilderness inhabited only by dawn-of-civilization people who make most of their weapons of wood, wear no clothes, have no permanent shelter and are constantly warring with one another. His goal: the sources of the Orinoco, a complete puzzle [*Continued on page* 170]

Pool is permanent installation, holds 15 persons. It is weather resistant, can be cleaned with soap and water. Larger, smaller models are in the works.

pleasure in plastic

Cabana can be used at beach or pool, or as playhouse for children. It won't tip or blow over.

TWO new miracles of Vinylite plastic are the swimming pool, above, and the portable cabana, right. The pool is full size, lawn type, measuring 27x13 feet with a graduated depth of three to five feet and holding 10,000 gallons. Weight of pool liner, bumper and cover is 200 pounds. Liner is set in excavation and anchored by 2x4's at corners while drainage pipe can be built in or sump pump can be used. Cabana weighs 14 pounds, folds into a suitcase-size package. It has an eight-foot, hexagonal base and sectional center pole nine feet high. Base sides are inflated separately. Front has slide fastener and side panels are ventilated. Bilnor Corp., Maspeth, L. I. •

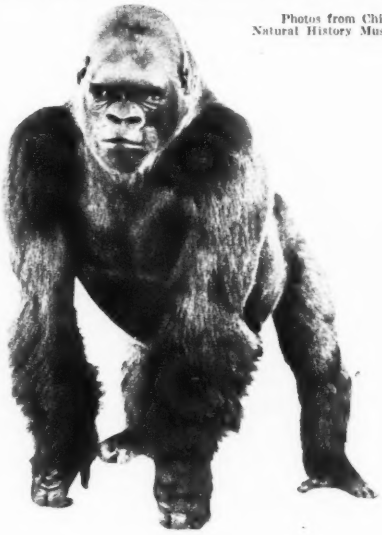


In Chicago Natural History Museum his skeleton was reinforced with armature of iron pipes. Ribs were covered with wire screen, burlap, plaster.

Clay body was molded over burlap frame. Careful measurements were taken before taxidermy so finished mount would be accurate in all details.

Photos from Chicago Natural History Museum

GORILLA LIVES AGAIN



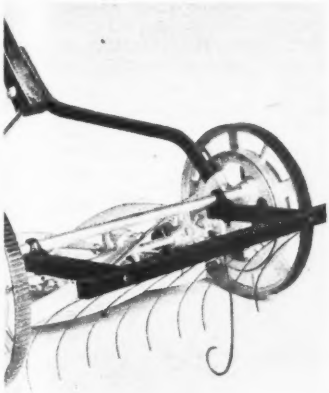
Everybody knew Bushman, king of apes. When he died the miracle of taxidermy made him immortal.

Four-piece plaster mold was made from clay form. Cast was made by applying plaster-wet burlap to inside of pieces, later assembled into body.

Tanned skin was applied to cast, head with celluloid base beneath face was added, then feet. Finally Bushman was ready again to meet his public.

NEW for the GARDEN

FEATHERWEIGHT MOWER: Electrically powered, weighs only 12 pounds and cuts 14-inch swath. Blades adjust from 0 to 2" cutting height. $57.75. Elec. Mower, Corsicana, Tex.



TEE-WEED: Flexible wires comb grass, lift weeds upright. Attachable to any type mower. $3.50. Garden Tool, New Haven, Conn.

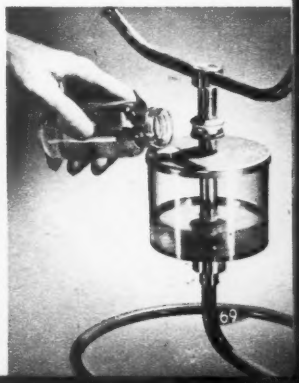
HUFFY-MOWER: Electric lawnmower operates noiselessly, has retractable blades, push-button controls. $52.95. Huffman, Dayton, O.

SPIKE-DISC: Long, knife-like blades loosen earth so water and fertilizer can be absorbed. $15.00. Ohio Machine Prod., Columbus, O.

SNAPPIN' TURTLE: Skidpan replaces front wheels and maintains height over ground. $214.12. Southern Saw, Atlanta, Ga.

COMFY-CULTIVATOR: Hand gardening is made easy with these steel fingers. Rubber cushion fits arm. $2.95. Dreers, Phila., Pa.

LAWN SPRINKLER: Jar can be filled with insecticide, weed killer or plant food. Feeds automatically. $9.95. Misch Mfg., Mishawaka, Ind.



Toys With Golden Tunes

By Louis Hochman

PEOPLE who insist that the golden days of opportunity are over for small people to make big fortunes, should take a look at Ruth and Elliot Handler. They're California's living proof that such days will never die—or at least haven't died yet.

This aggressive young couple—they're both around 35—starting from rock bottom-minus and skyrocketed a garage make-shift workshop into a $4 million a year toy business. Today it is the largest enterprise of its kind west of the Mississippi.

Their company, Mattel, Inc., located on the fringe of the Los Angeles International Airport in Inglewood, Calif., hums with activity in a brand new 60,000 square foot factory building complete with private

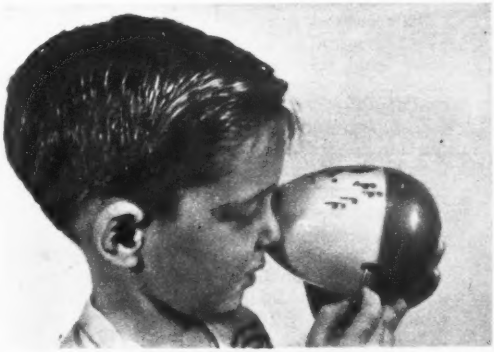
Popular musical toy is Jack-in-the-Music Box. Turning crank plays "Pop Goes the Weasel." When tune reaches "Pop," up jumps a clown.

Starting from a tiny workshop in a garage, Ruth and Elliot Handler created a $4,000,000 industry, largest of its kind west of the Mississippi.

railroad siding and truck-loading depot. Through the courtesy of Elliot Handler's inventive genius and the toy-making innovations he introduced, assembly lines manned by from 400 to 650 workers function with split-second precision, turning out as many as 30,000 toys a day during the peak seasons—toys which play a merry tune of nursery rhymes.

Living with such fabulous success, however, didn't come easily to the Handlers who remember all too well how just a few short years ago in 1944, they were so broke that Papa Elliot had to put the bite on his pals in order to raise enough cash to bail his wife and new-born son, Kenny, out of the hospital.

Ever since they married in 1937, the ups and downs in their lives had made life



Peek-A-Boo Egg plays music when crank is turned, and rabbit dances inside on rotating turntable.

When Chuck Wagon is pulled the donkey prances, cowboy dances, wagon plays "O Susannah."

Musical Book plays appropriate tune to accompany the lyrics read by the child as he turns the pages.

Musical Merry-Go-Round reveals its secret. Unit in base plays music, turns animals by fiber gear.

Twirl-A-Tune has endless, knob-studded rubber belt which flips harp wires when handle twirls.

one continuous roller coaster ride for the Handlers. Elliot, a poor but talented industrial designer, struggled through art school and a subsequent stint in the army while Ruth kept the homefires burning with her job as a secretary at Paramount Studios. They lived in a modest $27.50 a month furnished flat (remember those days?) and drooled over the classy $37.50 a month unfurnished apartments in the newly-built apartment house across the street.

Finally, splurging all, they moved into one of the new apartments, determined to raise the extra ten bucks a month by hook or by crook. They also were faced with raising some furniture for their new abode and Elliot got to thinking out loud how he could make some fancy Lucite end tables, coffee tables and other pieces of much-needed furniture.

"If you can make that stuff for us," cut in Ruth, the practical thinker, "you can make it to sell." So they blew their meager savings on a set of cheap power tools which they set up in their half of the apartment's two-car garage. Elliot proceeded to design and make furniture and Ruth hustled around selling it—with good success.

Eventually, the occupant of the other half of the Handler garage got tired of viewing his car through the generous deposits of plastic and sawdust from Handler's handicrafts, and Elliot was invited to kindly move his enterprise elsewhere. With borrowed capital and some new partners and stockholders, the enterprise, by now turning out novelty jewelry made from scrap plastics, grew into a phenomenally successful business.

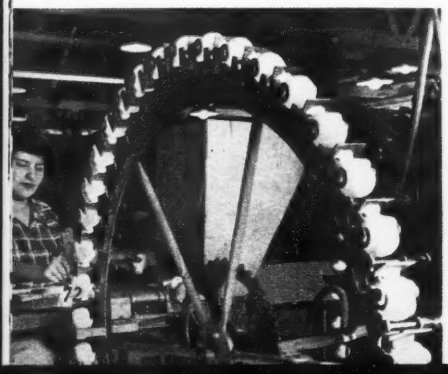
But Elliot wasn't satisfied with the setup, so kissing his financial security goodbye, he sold out his interest in the company, borrowed some more money and teamed up with a friend named Matson to form Mattel, Inc.

More ups and downs blessed and plagued the couple until, in order to use up some scrap wood they had on hand, they gravitated into toy furniture. This was during the post-war period when fly-by-night toymakers were still turning out cheaply-made wood and paper toys for not-so-cheap prices. The only toy pianos available then were made of wood and priced from $5 on up the scale. Elliot threw a monkey wrench into this monopoly by producing a miniature plastic piano with raised black intermediate keys, something no one had ever done before. And he sold it to retail for $3.

This caused a furore at the New York Toy Show and subsequently 600,000 pianos were sold. However, when the day of financial reckoning came, Elliot found he had also thrown a monkey wrench into his own business by underestimating the production costs of the piano and underselling it to the tune of a devastating $30,000 loss!

As it turned out, however, this boner proved to be a blessing in disguise—one of the best things that could have happened to the harried Handlers. Those 60,000 pianos earned for their producers a nationwide recognition as fine toy manufacturers which $30,000 [*Continued on page* 174]

Wheel designed by Elliot holds clown heads together while they dry, turns one head at a time.



In Chuck Wagon assembly donkey gets both wheels at once by power press, then wire harness.

THIS MONTH'S PRIZE

gadget

FYR-LARM Whistle

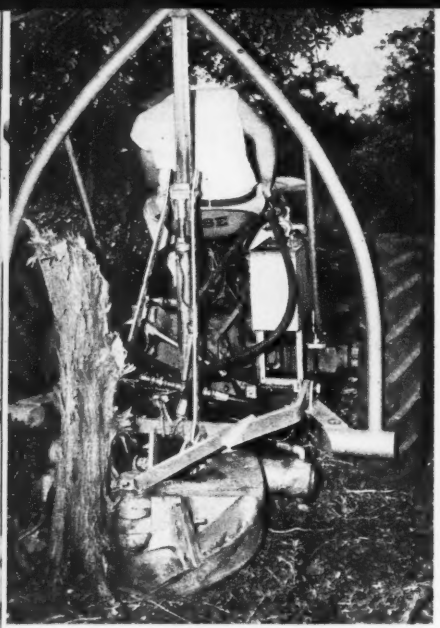
This is the 12-inch whistle. Larger 15-inch model is suited for office or factory. It is hung by placing ring at top over nail on wall. Decorative covering snaps on to hide it.

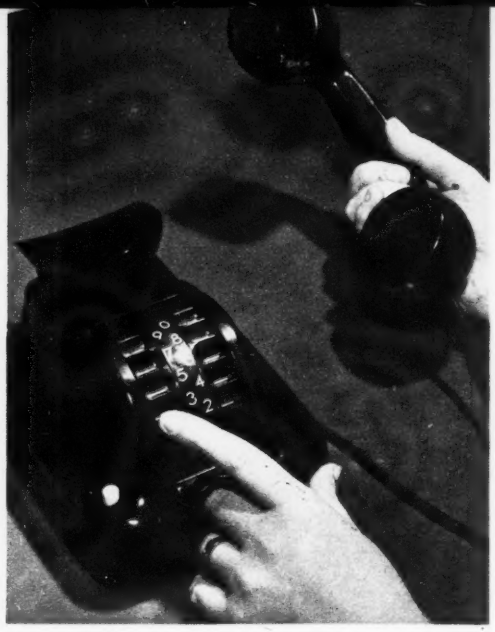
WILLARD Messick of Syracuse, N. Y. was in bed with the flu one New Year's Day when his wife brought him a newspaper. It told how a fire had killed a young mother and her two children the previous day. "Can't someone prevent such tragedies?" he asked. Someone could and did. That person was Messick himself. His new-type fire alarm is a steel cylinder loaded with a harmless gas under 1,800 lbs. per-square-inch pressure. When the temperature of its surrounding air reaches 120 degrees F. a valve opens and a whistle blows so shrilly that it will bring the deepest sleeper back to life with a jolt. The sound will penetrate wooden flooring and can be heard for a quarter of a mile. Messick certainly merits MI's award for his clever life-saving gadget. •

WIN $50

Dreamed up a neat gadget? If you're pretty keen about that pet project of yours, get busy and work it out in your shop. Then send pictures and a description of your invention to the Gadget Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y. Each month the best entry will be given a cash prize of $50.

The inventor at the test bench in his Syracuse Fyr-Larm Co. at 113 South Midler Ave. Megaphones amplify the 1½-minute whistle.





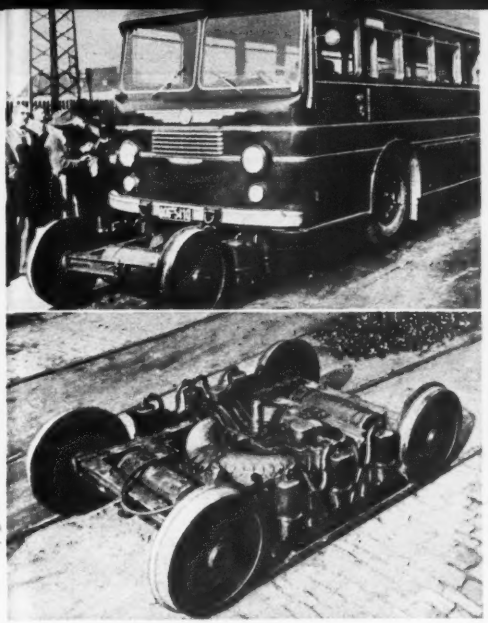
Tree Shears devised by Clarence McFall of Bastrop, Texas, snip off at ground level trees up to 15 inches in diameter. Blades are powered by hydraulic pump. They cleared 200 cedar stumps in one hour, five hardwood trees in a minute.

Cylinder Dial for phone shortens dialing time, and simplifies the procedure. Designed only recently in Germany, this device eliminates the round-the-clock finger dial. Instrument is also equipped with a sound modulator (button on left).

NEW in SCIENCE

Automatic Lift for putting up a pole-vault bar was demonstrated recently at Millrose Games in Madison Square Garden by official Jim Lyons. Reverend Bob Richards christened it by vaulting 15 feet to win, his sixth-straight Millrose victory.

Coffee-in-Bags is now available in Berlin. It was first served at a sports meeting last winter for 40 Pfennigs (10 cents) a sack. Heated in the cold weather, it will be served iced during the summer months. Straws are included; bags are disposable.



Bus-Trolley soon will be a common sight on European roads. Can be driven on the streets like any other bus, but in addition can be lifted onto railroad wheels and used as a trolley car. Bus is given its trolley wheels, top; bottom photo shows unit.

Waterproof Walkie-Talkie is dipped in a fish tank to prove that it will operate with no loss of efficiency no matter how wet it gets. Its temperature range is from —40 to 131 degrees F. Bubbles in photo are caused by water turbulence.

Radio-Controlled Lifeboat is dropped by parachute from a rescue plane, stays upright in water. Engineers of Westinghouse have developed its electrical control system which takes radio signals from plane. Craft is steered by remote control.

IT'S A LOONEY

Lunar influences? Pure superstition, people used to say. But science is now discovering that there may well be something to the old wives' tales.

By I. B. Neer

Y MOON

IS there such a thing as moon madness? Can the moon drive you crazy, paralyze you, strike you blind? Can its rays kindle within some mentally deranged persons an irresistible lust to set fires?

Strong scientific support is emerging for the theory that a definite link exists between emotional disturbances and the phases of the moon. A remarkable series of experiments, lasting two years, has just been concluded at Duke Medical School in Durham, N. C., showing this relationship. Much more work remains to be done, more proof is needed—but the amazing tests provide the first broad hint that there may be something to the age-old superstitions after all. There may be a moon madness!

Before going into the details of the unique Duke experiments, let's look at some of the most recent evidence which has been piling up from all corners of the world on what the moon has done to people.

In British Guinea, two natives fell asleep on a plateau in the full of the moon. Around four a. m., one awoke suddenly and—for no apparent reason—grabbed a huge rock and bashed in the head of his sleeping companion. Then, screaming wildly, he bolted across the plain and plunged head foremost down a rocky gorge to his death.

In India, the left side of an Englishman's face was temporarily paralyzed after he slept with it exposed to the moon's rays. A month passed before full normal use of his facial muscles returned.

In the Pacific, an 18-year-old merchant sailor who had been sleeping for weeks in the direct rays of the moon suddenly noticed that he was totally moon blind. Between decks, by daylight and even in the dark before the moon rose, he could see perfectly. But the moment lunar rays emerged, he could see nothing.

The full moon, it has been established beyond question, exerts a mysterious but powerful influence on pyromaniacs. Many fire chiefs admit their departments are especially alert for firebugs when the moon is a huge golden ball in the sky.

Thomas P. Brophy, the most famous arson expert in the United States, who retired as chief fire marshall of New York City after 42 years of firebug chasing, says: "There is absolutely no question but that a full moon brings out the pyromaniacs in greater numbers. My men and I always kept a sharp look out for suspected pyros during those times. I planted men in zones where they were operating and I would frequently patrol the streets myself during those moonglow hours.

"I questioned hundreds of those we

When the dark of the moon, a solar eclipse and a holy bathing day happened to coincide recently, thousands of Hindus fought to take their turn bathing in the great holy Lake of Kurukshetra.

Solunar Tables of the future may make it possible for all fishermen to know when giant 47-pound bass such as this guy are running.

caught and their answers invariably were that something came over them in the full moon period, a strong urge they couldn't fight. They just *had* to see bright orange flames dancing toward the sky. They couldn't explain why; all they knew was that the compulsion was there and that it came when the moon was full."

Mr. Brophy recalls the time not long before his retirement when a series of almost 40 suspicious blazes was terrorizing neighborhoods in the Bronx, N. Y. He had 400 men out in a vast dragnet to catch the bug, but with no luck. One night, while he was personally patrolling the streets, he encountered a detective who asked: "What brings you out all the way up here tonight?"

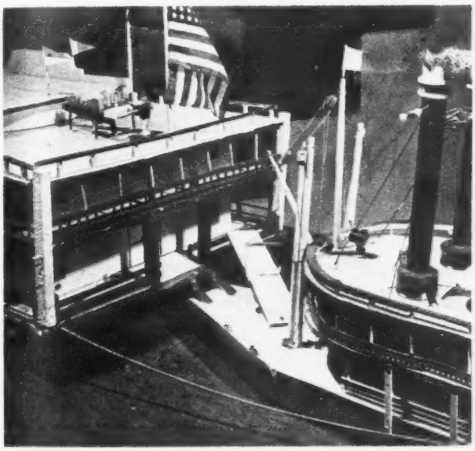
"Did you get a good look at the moon?" Mr. Brophy rejoined. The detective cast an eye toward the heavens—the moon was a bright, shining globe, round and full.

Minutes later, a fire broke out in a tenement scarcely a half mile off. And while Mr. Brophy was investigating its origin, another glow appeared in the sky—bright orange flames laced with killing black smoke. Both blazes had been set in the full of the moon!

Despite a fine-combing of the area, the firebug got away. [*Continued on page* 181]

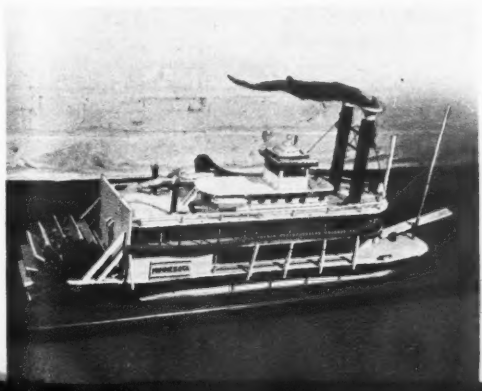
Albert Stroud of Hastings, Minnesota, builds boats for museums. Each contains Mississippi driftwood.

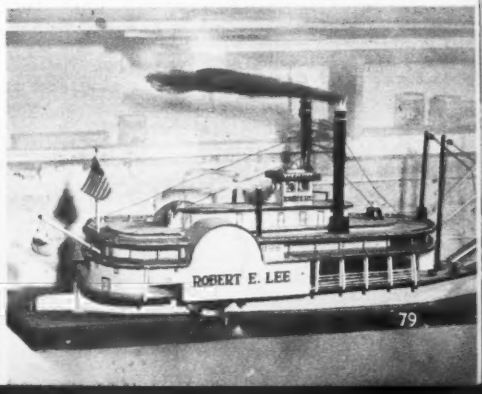
Mississippi's Little Fleet



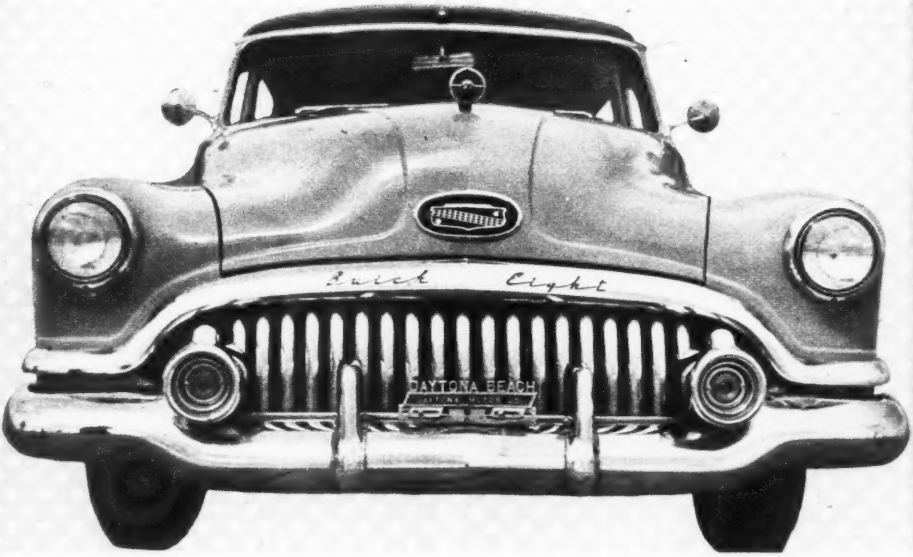
Showboat was a floating theater moved by a pushboat as shown in photo above. Minnesota, below, was a packet carrying passengers, freight. Mayo brothers of hospital fame bought the original.

Stroud builds about six boats every winter, plans them from memory and pictures. Robert E. Lee, below, was a side-wheeler historically famous for its race from New Orleans to St. Louis.





MI Tests the '52 Buick Roadmaster



Some 4,500 pounds of Roadmaster are mounted on a 130¼-inch wheelbase, one of America's longest cars.

THE Blimp boys will love the new 1952 Buick Roadmaster. It is a luxurious big 4,500-pound balloon that rides like a Pullman and is as silent as a pocketful of Jello.

This new job, with its four-barrel carburetor and Dynaflow drive, is a parade car at its best. There is no creep in the Drive range and wading through heavy traffic just calls for a bit of toe-tipping and an occasional touch of the brake. I have never driven anything more quiet, including Rolls-Royces, and low speed vibration just doesn't exist.

Bill France, president of NASCAR, arranged the test for me. He contacted J. Saxton Lloyd, new president of the National Automobile Dealers Association, who turned an Erin-hued sedan over to me from his Daytona Beach sales room. I had just finished running a couple of hot cars in the speed trials so this was quite a switch. As I drove off towards the NASCAR four-mile track for some trials and bumpy travel, I was immediately impressed with this big hack, first of all by the green window glass, green upholstery and green paint job which made me think for a moment that St. Patrick had won the election.

Driving toward the beach I fully realized for the first time that there are really two distinct types of cars built in America for two distinctly different markets. There is the cruising balloon, which includes the Buick, and the all-around fast utility car. The Buick Roadmaster is tops in straight line driving of major turnpikes and super

"I have never driven anything more quiet," says Uncle Tom of the luxurious big Buick whose armchair comfort and road-holding qualities make it an outstanding automobile.

By Tom McCahill

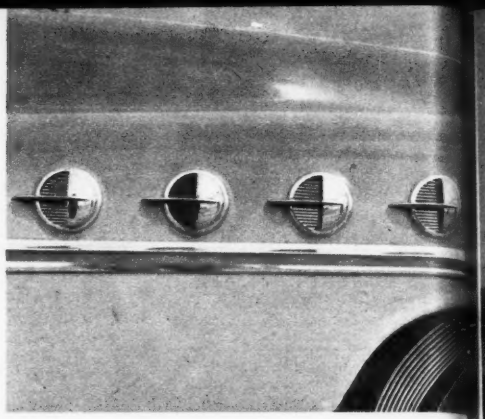
On the front stretch of the sand race track at Daytona Beach, Tom and Joe discuss the new Roadmaster.

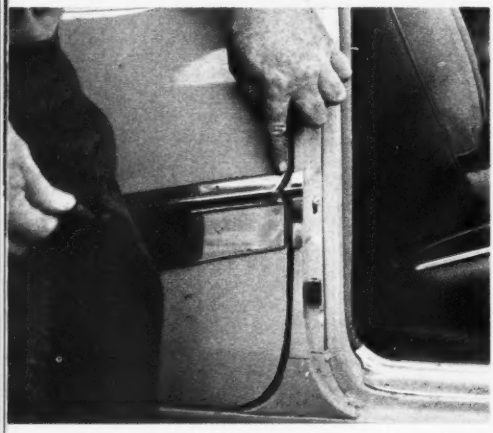
highways and in follow-the-leader traffic. The big 130¼-inch wheelbase of the four-door sedan and its 4,500 pounds of weight actually make this car feel like a Pul'man and react about as agilely. The difference in feeling between this job and a Ford or Chevvy is the difference between a fighter plane and a B-36.

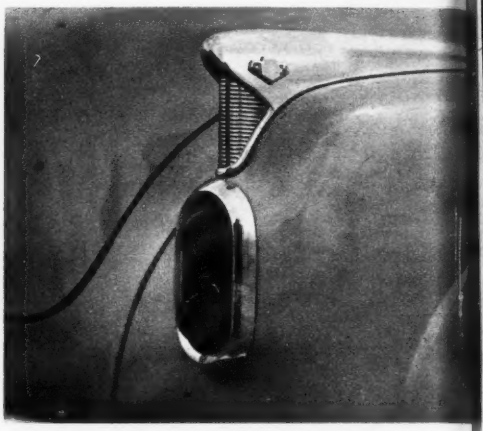
Buick men told me that this rig cornered with the best cars in the world and held the road like grim death. The first statement is a masterpiece of exaggeration, the second isn't too far off. Considering its size, the Buick corners very well and has less tail-wander than some of its more expensive competitors. But it has a long way to go in my book before it could be rated with the best in a tight turn. The soap bubble ride that irons out pot holes and bumps as if they didn't exist defeat this car when it comes to cornering ability. It gets around and very well but it's no Jaguar or even a Hudson Hornet in this department. On fast, twisty roads this balloon is just too big to be driven with any degree of safety at speeds. This is a magnificent parade and turnpike car . . . period.

Buick also offers, as optional equipment, power steering which was not on the job I tested. However, having seen power steering in action on the race course, I feel sure this addition would not improve Buick's chances at Le Mans or around Dugan's tight corners but it will take less arm moxie in sidling up to a parking meter.

The big news at Buick this year is its new four-barrel carburetor. This gizmo,







The big Buick's handsome instrument panel won Uncle Tom's approval but he ripped his tailor-made trousers on a spearhead of chrome trim. Otherwise he liked the de luxe appointments.

The familiar Roadmaster four-eyed peepholes are not changed this year but something new has been added in rear fender fins and lights. Tire you can partly see in top photo is the new "whiteway."

according to the ads, has raised the Roadmaster horsepower to 170. Sometimes I wonder if they can tell the difference between a horse and a pony out in Detroit. Actually, with Buick's Dynaflow transmission, it's pretty hard to judge how much horsepower is under the hood for getting you over the ground. But the 1952 jobs claim an increase of 18 horsepower through an increase of compression ratio from 7.2 to 7.5 to one, plus the new atomizer.

In Buick's press releases, they say they have put 12 years of work on this new carburetor, which is in reality two old double-barrel carburetors sewed together. Here's a very rough picture of how they work. Let's call the first part of the new four-barrel system Eager Beaver. This poor, overworked slob does most of the work and is the same as most standard two-barrel jobs. Living in the same apartment with Eager Beaver but in another room is Flashy Dan, the power demon. Flashy Dan is actually another two-barrel carburetor attached to the first. But, and this is a big but, Flashy Dan only cuts in and goes to work when the throttle is opened more than halfway. Eager Beaver works all the time and Flashy Dan only joins him for the fun of more speed.

There are one or two more things about this carburetor of no world-shaking importance but I guess the guy who spent 12 years building this Siamese twin had to do something with his spare time. The net result? Well, climb into the Roadmaster, floor the accelerator, and what do you get? Twelve years ago, before the guy started his long job, the pre-war Century Buick would cream this new offering as if it were tied to a post. Ah! What progress!

Tom nears the finish line of the measured mile in one of the many acceleration tests he ran through in Florida. "No ball of fire in performance," he found, despite new carburetor and higher power.

The Buick is, as already stated, a top-flight luxury vehicle but it's no ball of fire in the performance department, four barrels or not. Once it overcomes the retarding action of the Dynaflow transmission it really rolls. But at speeds up to 60 from a standing start it can be topped by several other American cars. Zero to 60 in Drive all the way averaged 18.5 which is out-and-out poor for a car of this claimed horsepower. To get any performance worth while mentioning it is necessary to start in the Low range and shift to Drive just as you pass 50. This lowers the zero to 60 average to 14.6 which is fairly respectable. Zero to 30 in Drive takes a very slow 7.8 and using Low and Drive, 5.8 seconds, which is still very backward for 170 horsepower. As Tigertail McGuinness, the Philadelphia Philosopher, might say, you can't have [*Continued on page* 171]

SPECIFICATIONS

MODEL TESTED: 1952 Buick Roadmaster four-door sedan

ENGINE: 8 cylinder (straight), OHV; bore 3.437 inches, stroke 4.312 inches; maximum torque 280 foot pounds @ 2400 rpm; brake horsepower 170 @ 3800 rpm; piston displacement 320.2 cubic inches; compression ratio 7.5 to 1

DIMENSIONS: Wheelbase 130.2 inches; overall length 215 inches; tread 59.1 inches front, 62.2 rear; width 80 inches; height 63.2 inches; weight 4,452 pounds; standard tire size 8.00x15; gas tank 19 gals

PERFORMANCE:

	(Low and Drive)	(Drive all the way)
0 to 30 mph,	5.8 seconds	7.8 seconds
0 to 50 mph,	12.1 seconds	
0 to 60 mph,	14.6 seconds	18.5 seconds
0 to 70 mph,	20.1 seconds	
0 to 80 mph,	27.8 seconds	

Half-mile from standing start, 34.1 seconds
Top speed, 96-97 mph

SPEEDOMETER ERROR: At 60 mph on speedometer, actual speed 55.21 mph

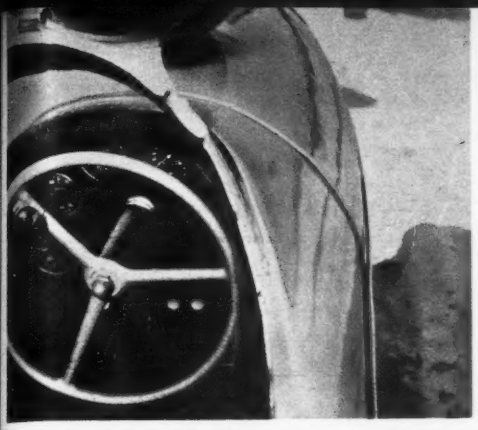
Draftsman Richard Harp shows his "sky car" to his wife. It cost him two years of spare time and about $1,500.

Three-Wheel

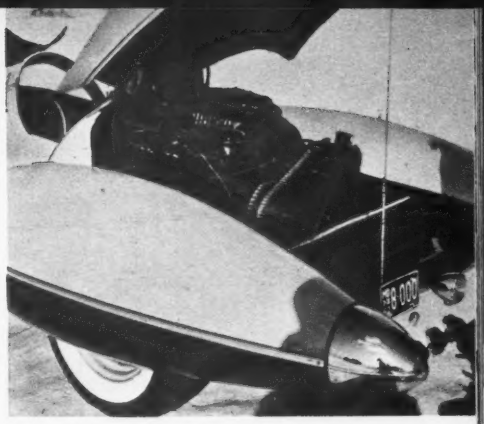
TWENTY-five-year-old draftsman Richard Harp spent his spare time kicking around the airfields of western Maryland longing for any chance to bolt off into that wonderful wild blue yonder. It was only his new baby daughter and his attractive young wife which kept him from taking off from his drafting table for a career in the sky.

Since he couldn't zoom away at will, he decided to bring a bit of the wild blue down to earth for his personal enjoyment. And that's how he got started on his unique three-wheel hot rod. From the airfields he salvaged a big belly tank, two small wingtip tanks and some Grumman aviation instruments. The belly tank he made into a streamlined chartreuse-and-black body with one seat in the red-plush cockpit. Each wingtip tank he converted into a housing for a wheel taken from a 1937 Willys, located toward the tapering tail of the body.

Like the modern tricycle landing on a jet, the nose of this fuselage holds a smaller special wheel, the third one in the three point setup of the car. He combined the aviation instruments with dials from a Chevrolet to form a flashy dash for his aero-auto.



Grumman aviation instruments and dials from a Chevrolet form the dashboard of this hot rod.



Snap cover lifts up behind cockpit to reveal Lycoming engine with four opposed cylinders.

In order to change the 6.00 by 16 tires, Harp removes the fender skirts from the rear wheels.

Nose of the fuselage holds a special small wheel much like the modern tricycle wheel on a jet plane.

HOT ROD

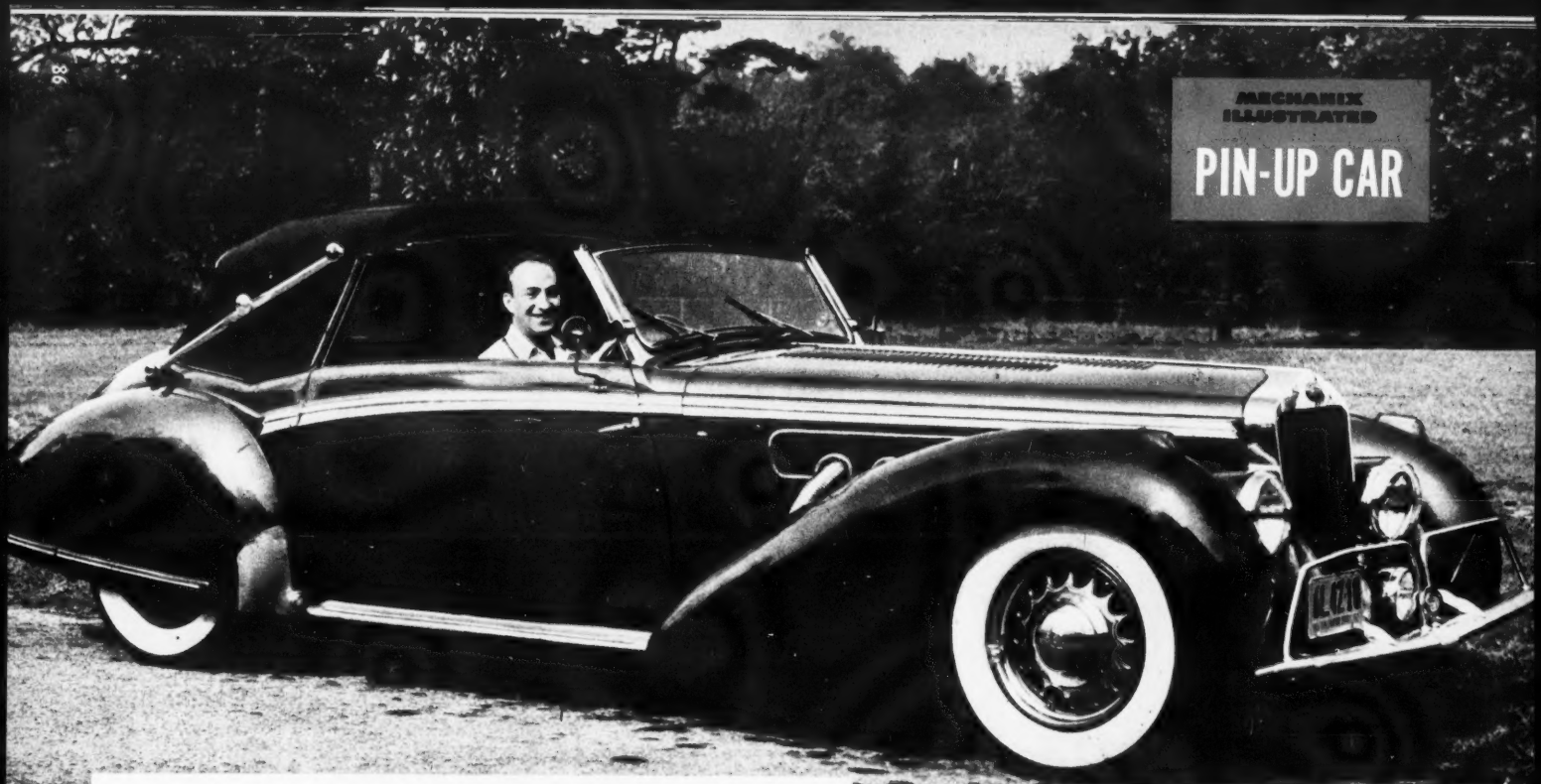
To hold these aircraft tanks rigidly together, Harp made up a frame of three-inch channel steel. For power he mounted a Lycoming aviation engine of four opposed cylinders on the rear axle. The power runs through a standard four-speed transmission from a Model 74 Harley-Davidson and drives the rear wheels by roller chains.

Harp's hot rod cost him two years of nights and weekends and some $1,500 in cash. The sporty three-wheeler contrasts dramatically with the staid family car Harp usually pilots around town—a Buick Super sedan. Length of the lowslung little home-made job is 14 feet, 6 inches. Weight is about 1,600 pounds—or about a dollar a pound in costs.

After driving the family bus, Dick gets a real thrill every time he hops into his single-seater for a "flight" down the road. He can do a smooth 80 mph—in second! Since there are no safe straightaways for speeding in his area, he has never yet pulled the gun on his hot rod. But, he estimates it will do 110 mph. Should the engine start heating up at such a speed, he can easily hook a belt and a fan to his engine for greater cooling. And he averages 20 miles to a gallon. [*Continued on page* 171]

MECHANIX ILLUSTRATED

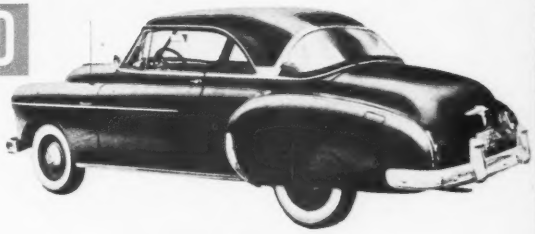
PIN-UP CAR



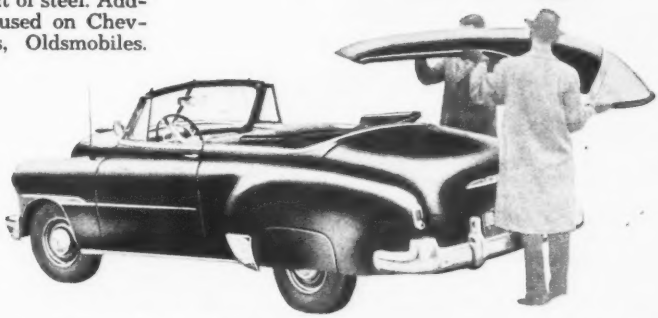
1939 French Delage D-8

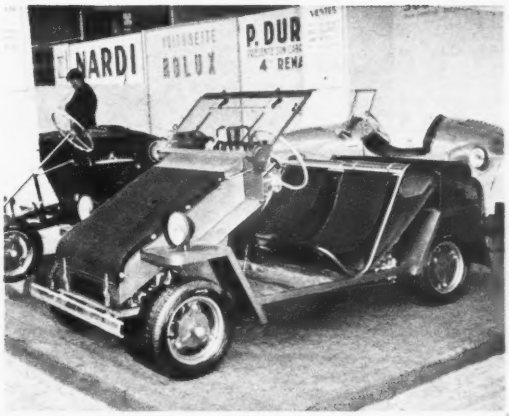
Owner: Herb Lozier, Brooklyn, N. Y. Engine: eight-cylinder, about 200 horsepower, overhead valves, oil-cooled radiator, 11 miles per gallon. Weight: 4,500 pounds. Wheelbase: 130 inches. Top speed: 120 mph. Color: grey. Instruments include brake meters for front and rear brakes. Car was exhibited at 1940 New York World's Fair.

NEW for the ROAD



Convertible Hardtop provides insulation for warmth in winter and coolness in summer. It is installed without drilling and has impact strength greater than that of steel. Add-A-Top can be used on Chevrolets, Pontiacs, Oldsmobiles.





Two-Cylinder Hot Rod at Paris Motor Exposition is the Bimobile Piaf, answer to a poor man's prayer. The rear-positioned motor is two horsepower, pushes the 380-pound car easily. Seats are canvas.

Spring Booster is a pneumatic air lift which fits in a car's coil springs, adjusts for overload, increases roadability. It is made of butyl rubber and regulated by air inflation. Also fits leaf springs. Air Lift, Lansing, Mich.

WIN $25

Send in a sharp, glossy photo of a snazzy car, old-timer or new, posed as at left with owner or a pretty gal. Include self-addressed, stamped envelope (just in case) and all vital statistics about car and owner. Mail to Pin-Up Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N. Y. 36, N. Y.

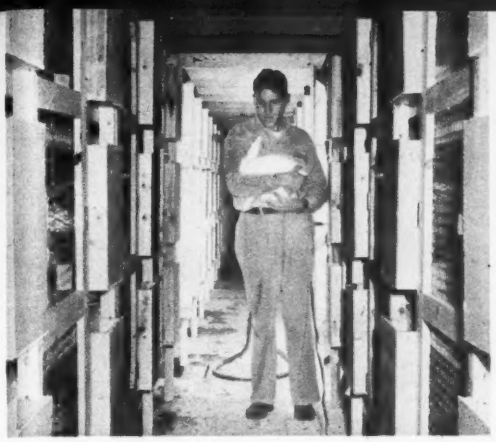
A MONEY-MAKING

idea

I'M A RABBIT BUTCHER

Everybody knows how fast bunnies multiply. Well, when you own a rabbit farm you find your income multiplies at just about the same time, too.

By Linwood Darling
as told to Art Henry



Triple tiers of hutches line the passageways of the main building. There are more than 1,000 of these hutches on the Darling Rabbit Farm.

Hutches in the slaughterhouse contain rabbits destined for the dinner table. Here, Darling removes a bunny preparatory to slaughtering it.

Each carcass is cut into quarters on an ordinary bandsaw. The total slaughtering process, including packing, takes about 2½ minutes per rabbit.

Each five-pound rabbit yields about 2½ pounds of meat—enough to fill one box. The containers are frozen and shipped to rabbit-meat markets.

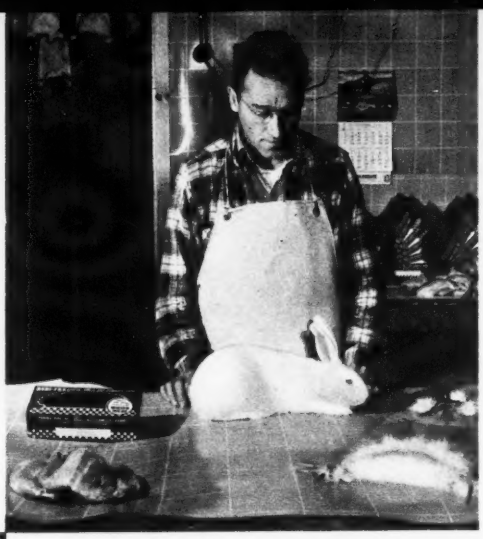
I'M happy that rabbits came into my life—big ones and baby ones, common varieties and show winners, live ones and . . . yes, dead ones. These latter are putting me on easy street because I'm the only licensed rabbit butcher in the state of Maine.

Five years ago I was a fairly successful chicken farmer in Cumberland Center. I scratched out a living by raising laying hens for hatching eggs and branched out into the broiler business. It added to my income and every little bit helped.

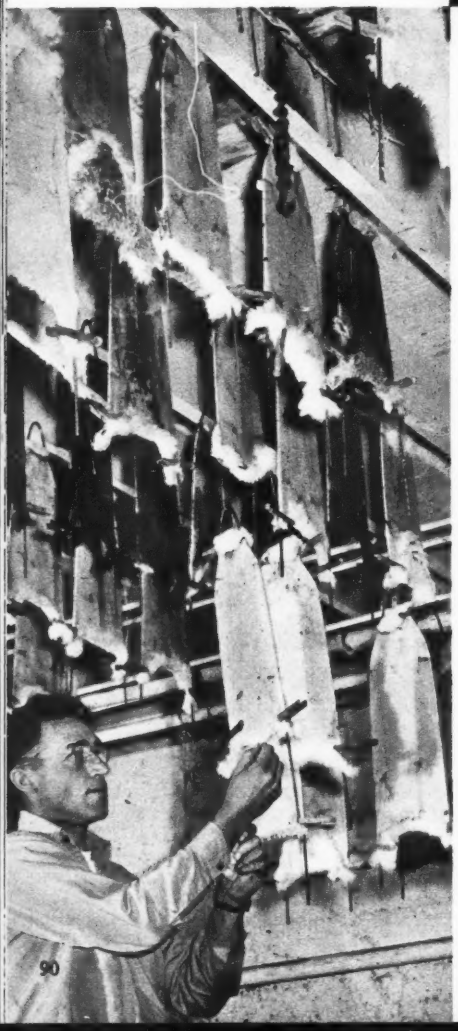
Then a puppy dog started me on the road to multiplying rabbits and my income. Here's how it all began. One day, early in 1947, a friend gave me a spaniel puppy. I liked the little scoundrel but he was a nuisance around the farm and didn't get along with my chickens. So, I traded him for a couple of female rabbits. My wife and I were fond of rabbit meat and I figured we could raise a few so we could have ourselves some hassenpfeffer every now and then.

A few! Now I have about 3,000 and I butcher from 250 to 300 every week. Those first two does had litters. I raised the young, slaughtered them, ate some myself and sold the rest to a neighbor. With this profit I bought six more does. These littered and the same thing happened. I found myself with

Bunny in center cost Darling about 75 cents to raise to maturity. After it is slaughtered it will yield the ten-cent skin, right, and about $1.50 worth of edible meat, left.



After the rabbit skins are stretched, they are hung for a drying period before being sold to the Danbury felt-hat manufacturers. Note that pelts are turned inside-out to dry.



more rabbit meat than I could eat.

The local grocer was a friend of mine. "I'll buy some of it," he offered, "and sell it to my customers." I made $23 on this first order.

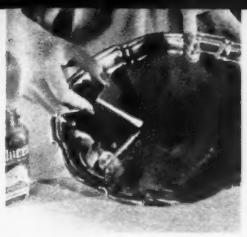
The demand increased and soon people were banging not only at the door of the grocer but at my door, too, and I was supplying an average of 20 pounds of meat each. I was in business.

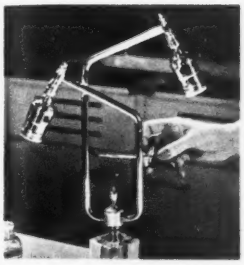
Rabbit-raising and slaughtering is one of the easiest and cleanest occupations—certainly much cleaner than chicken raising. For rabbits are careful about their toilet. Their meat is pure and wholesome. They breed rapidly and are cheap to raise. It costs about 75 cents' worth of commercial pellets to feed one to adulthood. I decided to forget my poultry and concentrate on the bunnies.

My home was the initial scene of operations but rabbits soon threatened to drive me out of it by sheer numbers. I launched my business officially with a couple of males, or bucks, and 15 does. Soon the rabbits were running all over the place and my hired man threatened to leave.

So, I built a small two-story building next to my house. In the cellar, I set up a slaughterhouse and used the first floor for pens. Last year, I converted a 100-foot barn into a modern breeding house filled with the latest conveniences for rabbit light housekeeping. It contains over 1,000 pens or hutches worth $6,500.

For breeding, each hutch must be at least ten square feet in area so the doe can move around freely. She will produce about five litters each year and average eight babies or lambs to each litter. Therefore, one good doe will produce [*Continued on page* 189]





Tarnishproof transparent coating of Vinylite seals in gleam of metal. Brushed on easily, Silvern is removable by peeling. Merchants Chem. Co., Stamford, Conn.

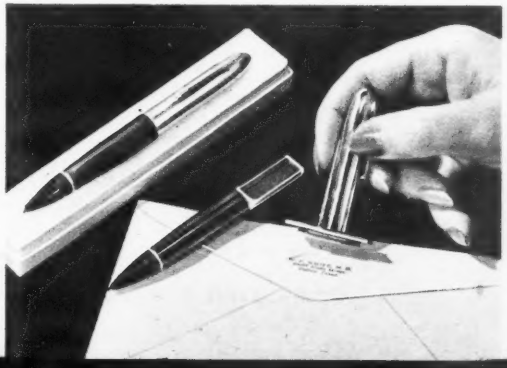
Squeeze-Bottle Cleaner eliminates water washing and streaky windows in home or auto. Container is unbreakable. Boyle-Midway Inc., 22 E. 40th St., N. Y. C.

NEW for the HOME

Cedar Closets at low cost are available by brushing or spraying inside with canned, pulverized cedar wood. Protective qualities, fragrance last indefinitely. Cedar-Lux, Kansas City, Mo.

Stamp-O-Pencil with removable die plate contains small stamp with owner's address. Rubber die presses against ink pad when closed. Elsart Novelties, N. Y. C.

Inflatable Pillow provides comfort for traveling or at home. Deflated, it fits pocket or purse. It is washable Vinylite, resists dirt. Beaumond Distributors, N. Y. C.



Landlocked Leapers

He hits fast, jumps, then comes in slowly. But watch when he gets near the boat. That's when the fight begins.

An eight-pounder is a big fish. This jack, lean from spawning, was caught on a trolled Gray Ghost.

By Raymond R. Camp
Rod and Gun Editor, N. Y. Times

MOST any day now the telegraph wires from Northern New England will be hot with the news: ICE GOING OUT! And then the mad scramble will begin. Fishermen's blood pressures will climb to the bursting point, little women will be hurriedly kissed goodbye and the roads to Maine fishing camps will be packed with impatient anglers.

It's a thrill that comes once a year. Sometime between April 15 and May 15 the winter ice disappears from Maine's lakes—perhaps in as short a period as 24 hours. Then the small, silver smelt invade the open feeder streams to spawn and the mighty landlocked salmon break their

In the spring a fisherman's fancy seriously turns to thoughts of landlocks—and ice-out finds him making tracks for his favorite Maine lake.

Paradise to a landlock fisherman, Rideout's Camp at Danforth, Me., home of East Grand Lake's big salmon.

winter fast to feed. Flies resembling smelt are cast or trolled near the surface to lure the landlocks and when you've hooked one, he'll put up a fight you'll never forget.

Every fly fisherman dreams of the day when he will see a fresh-run Atlantic salmon jumping at the end of his line and no angler who has ever hooked one of these fish will give it second place. But, unhappily, a day on a good salmon river costs more than many fishermen spend on their sport in the course of an entire year. So thousands of anglers settle for the next best thing, the landlock, and while they are not as large, they often prove just as tough.

The landlock's formal title is Salmo Sebago, a name taken from Sebago Lake in Maine where he was first discovered. In

The landlock is cousin to the Atlantic salmon. He can't go to sea, is smaller, fights as hard.

In early spring or late fall when salmon feed on the surface, fly casting and spinning will get results.

Canada he's called by his Indian name Ouananiche (wananish). Actually he is an Atlantic Salmon which became trapped in an inland lake many years ago when he came up its outlet to spawn and couldn't return to the Atlantic when the outlet was destroyed by a sudden change in configuration of the earth's surface. He doesn't have the stature of his sea-run brother but he has all of that fish's fighting spirit. Anyone who has ever hooked a landlock will testify to that.

My first experience with these fish was when I was a youngster and it came as something of a surprise. I had been salmon fishing with my father and before returning home we decided to go up the Peribonka for a few days with a friend. On the return trip our car broke down and we were forced to spend some time at Pointe Bleu while waiting for new parts.

I was turned over to an Indian trapper who guided during the off-season and we set out on Lac St. John to see what was available in the way of fish. The Indian muttered something about "Ouananiche" but this meant nothing to me and when he stopped the canoe near the mouth of a small feeder stream, I stripped out some line and made a few casts with a streamer, letting the fly swing out with the current. After four or five casts brought no results, I looked at my guide but he motioned for me to keep casting. The next cast brought the surprise.

My fly, I remember, had swung around to the rim of the current and I was about to pick it up for another cast when the rod was almost jerked from my hands. Simultaneously a bright, flashing fish broke water and crashed back with a splash. The reel whined and the fish jumped again. I had a fairly light leader and a line with no backing so I decided it was time I put on some pressure. There were three or four more jumps, each more distant, and I realized I had waited too long. A final jump and "ping!" The leader parted.

The Indian looked at me, no hint of a smile on his dark features, then nodded. "Ouananiche."

I replaced the leader, tied on another streamer and began casting once more. It was about 20 minutes before I had another strike but this time I was ready and from the first jump I put on all the pressure the leader would take.

When it began to appear that I was losing line too rapidly I motioned to the Indian to follow the course of the fish in the canoe. After about 15 minutes the guide slipped the net under a five-pound fish that to me had all the earmarks of a grilse. With the fish in the canoe I picked up a paddle and made use of the sign language to show I wanted to return to our starting point. I had to show my father that fish.

Since then I have sought out landlocks in a score of Maine, New Hampshire and Vermont waters, and [*Continued on page* 177]

Capped Spinning Reel by Shakespeare has cover which reduces line swirl. Drag and non-reversing controls are at crank. It can be disassembled without tools.

Folding Containers of Vinylite stow away easily for campers and picnickers. Set includes a one-gallon water bucket (with handles), cup, wash basin, dishpan.

NEW for the SPORTSMAN

Antique Pistol for man's den is authentic reproduction of old-time piece. Shown is Pepperbox. Other models are available. Lee Gunsmith, Elins Park, Pa.

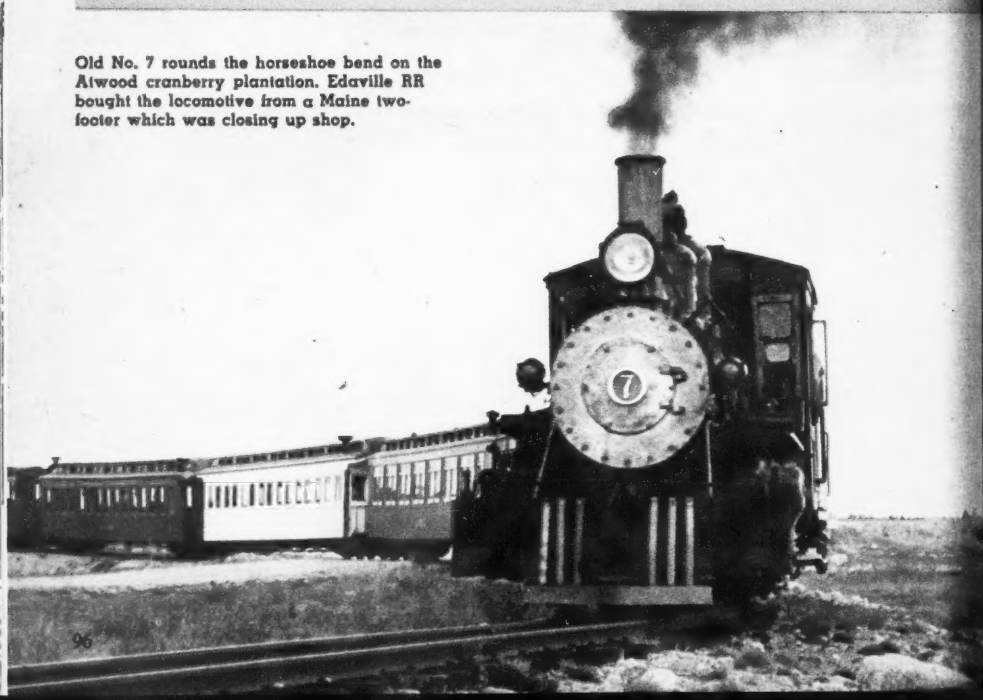
Hot Seat for cold-weather hunters or fishermen opens up to become a handy cook stove or tent heater. Back rest is for comfort; legs fold. Invented by wood-pattern maker Glenn Butler of Detroit, Mich.

Last of the TWO-FOOTERS

Although admission is free, sale of inexpensive souvenir tickets helps run the little railroad.

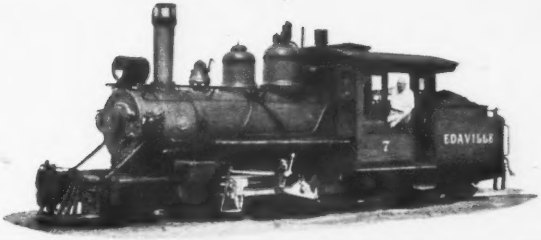
Sunday afternoon sees a sizeable crowd waiting its turn for ride through cranberry bogs.

Old No. 7 rounds the horseshoe bend on the Atwood cranberry plantation. Edaville RR bought the locomotive from a Maine two-footer which was closing up shop.



LS
wait-
bogs.

By Robert J. Whittier



During harvest season, train transports pickers to bogs and hauls berries to screening house.

Pot-bellied stove is focal point of station office. Here, Mr. Atwood, left, chats with the crew.

ON the spot where the Pilgrims once hunted near Plymouth, Mass., you'll now find the home of the last two-foot-gauge steam railroad in the world. Without a bit of high-pressure promotion and totally without the benefit of streamlined, air-conditioned equipment, the little Edaville Railroad sends train after train chugging out of its South Carver terminal jammed to the baggage racks with delighted passengers. Worried about the competition? Shucks, no—there isn't any! For this railroad is a hobby railroad and is proving to be as popular with the public as free samples from the U. S. Mint.

Like all American boys, the late Mr. Ellis D. Atwood (from whose initials the road derives its name) once cherished the ambition to become a locomotive engineer. Somewhere along the line that ambition was sidetracked and eventually he became owner of the world's largest privately-owned cranberry bog.

About ten years ago, the last of several narrow-gauge outfits up in the Maine wood banked the fires in its rusty locomotives and locked the station doors. Mr. Atwood quickly headed north to do some iron-hoss trading and soon a whole railroad was being transported by highway.

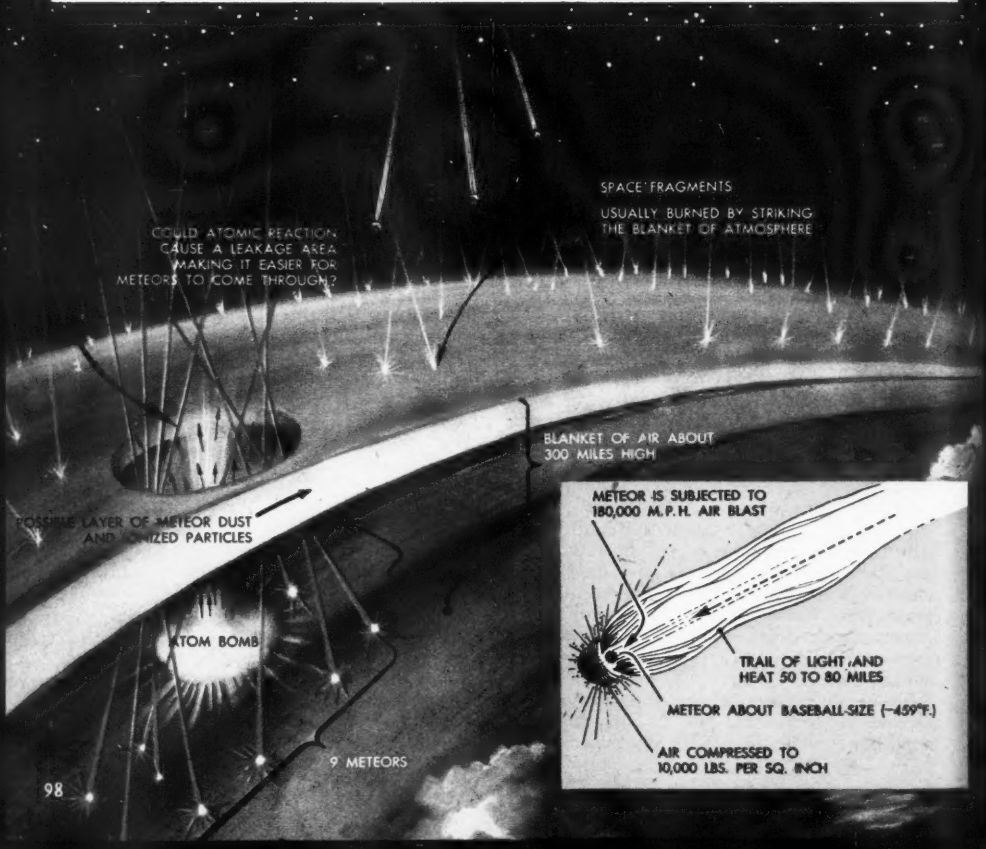
Today there are several miles of track running through the plantation. The railroad has a utilitarian value as a means of transporting the tons of sand required for bog maintenance. In the fall, cranberry pickers get a big bang out of being ferried to work on their own railroad. And flatcar loads of berries are rolled right into the screening house.

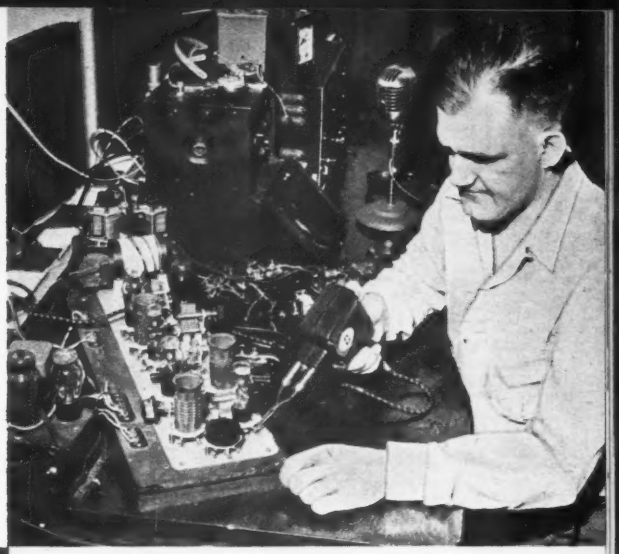
But on weekends during the warmer months and in evenings during the Christmas season a constant stream of automobiles follows the "Edaville Railroad" signs which show the way from main highways.

The Edaville Limited is a slow train; her roadbed falls short of Super Chief standards and she's apt to give you a cinder in the eye. But that's all good medicine for what ails you. And you'd better get used to it, for there'll never be any dieselization on the last of the two-footers. •

is our atmosphere leaking meteors ?

EACH time we see a shooting star we see the death of a space fragment that probably has been rushing through the vacuum of eternity for millions of years. Ranging from sand-grain size to boulders of many tons, a possible billion of these would rain upon us daily if it were not for the protective effect of our atmosphere. The earth's gravitational attraction reaches into space to pull these wanderers toward us at incredible speeds and when they reach the comparative thick "soup" of atmosphere, the resulting friction fires them into flashes of light and heat energy. Once in a while one of them is large enough to survive and it reaches the earth's surface. But recently something has gone haywire. The chance of two meteors being [*Continued on page* 171]





Gunderson displays his skill with soldering gun. Tip is placed into position and juice is turned on when he's ready. With it he can make five-tube transmitter without errors.

At Quarter Century Wireless Association meeting, he demonstrates testing of electronic equipment with instruments that translate circuit conditions into sounds for blind.

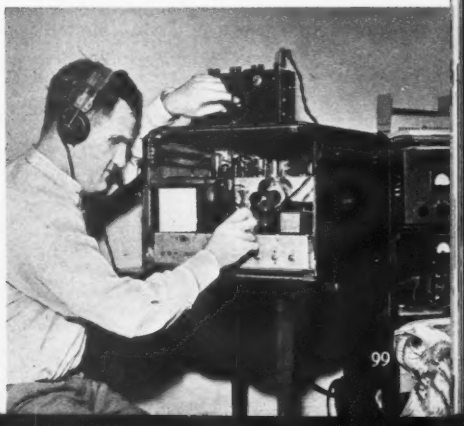
TV's Blind Serviceman

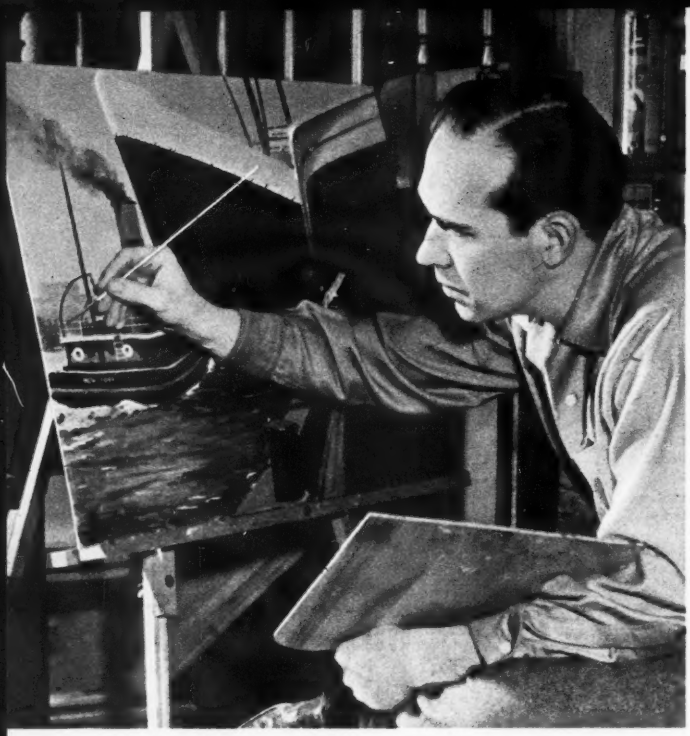
IN the East Bronx, N. Y. lives a blind man. He wears no dark glasses, carries no cane, follows no trained dog. In fact, in some ways he can see better than many men gifted with sight for he is a skilled radio and TV repairman.

Robert Gunderson, sightless since birth, began his career by assembling a crystal receiver at the age of six. Later he attended the New York Institute, then obtained an amateur radio operator's license. Now at 32 he conducts a two-year course in electronics at the Institute, free-lances and is employed by the Hudson Radio & Television Corporation. His success and confidence have made him an inspiration to all who meet him. •

Through his amateur radio station W2JLO he communicates with people all over the world. Cards on wall are acknowledgments from them.

With test instruments of his own design, Gunderson makes adjustments on TV receiver. He can do everything but check the image.





hobby
HALL OF FAME

Relaxation for Dr. George Rieveschl, Jr., director of chemical research for Parke, Davis & Co., comes through painting in oils on weekends. He once studied art.

Dr. George Rieveschl, Jr.— PAINTING CHEMIST

DETROIT'S "most outstanding man of the year" is what they recently named Dr. George Rieveschl, Jr., 35-year-old director of chemical research for the world-famous drug firm of Parke, Davis & Co. He's best known for his work on Benadryl, first anti-histamine in the United States to be made available for the treatment of hay fever and other allergies.

Dr. Rieveschl's days—and sometimes his nights, too—are filled with complex problems, the answers to which frequently benefit mankind everywhere. But he gets away from it all by sitting down at the easel in his Grosse Pointe Woods, Mich., home and painting in oils from photographs.

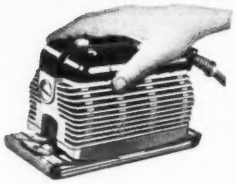
Painting comes easy for him, too, because he studied commercial art at Ohio Mechanics Institute for four years before his interest turned to chemistry. Luckily for medicine, painting became just a hobby.

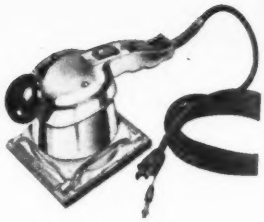
Dr. Rieveschl (pronounced "Reeve-Shell") comes away from these sessions "greatly relaxed and refreshed, ready for whatever the new week may bring." •

In the company's Detroit laboratories, Dr. Rieveschl, Jr., center, confers with two members of his staff.

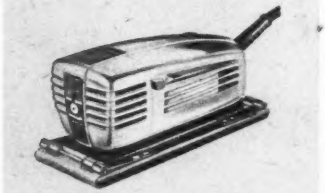
PICNIC GRATES

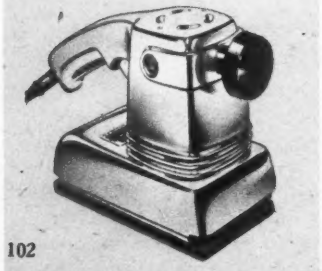
If you're like most picnickers you undoubtedly rebel inwardly at the necessity of packing an elaborate stove for the sake of cooking a few hamburgers and boiling a pot of coffee. If so, you'll enjoy the ingenious picnic grate devised by Joe Van Wormer. It consists of a half dozen ⅜ in. steel rods, each 20 in. long. Sharpen the points on the 4 bars used for the uprights so that they can be pushed into the ground easily. Now then, who'll chop the wood for the fire?





Portable Sanders





THERE are three main types of portable sanders in addition to the popular endless belt variety. These are the disk, the vibrator or reciprocating units, and the motor-driven orbital or oscillating machines. Prices range from about fifteen dollars up.

The flat sanding surface of the disk sander is round, with the abrasive mounted on a molded flexible pad, usually rubber. When in use the machine should be slightly tilted so that the part of the disk doing the sanding remains as flat as possible, yet sands the wood largely with the grain. It should be kept moving with a long, back and forth sweeping motion.

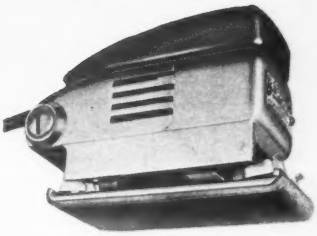
This tool will sand wood, metal, masonry, plastics, or glass on either flat or curved surfaces. It removes paint, varnish, and old finishes when open-grit sanding disks are used. By covering the molded pad with a wool bonnet, you have a machine for buffing and polishing furniture, metal surfaces, etc. The addition of a long extension handle permits its use as a floor waxer and polisher.

Attachments and supplies are available for most disk sanders that make them truly versatile. Some models require an arbor adapter for mounting the accessories. A drill chuck permits the sander to be converted to a power drill. Rust or scale is easily cleaned off before painting with either a cup or wheel wire brush. Cup grinding wheels may be attached for smoothing welds, etc. They are also available for use on cement.

Feather disk pads will make a feathering tool of any disk sander. They can be obtained with a built-in friction clutch that can be locked in for feather-edging or locked out for direct drive when sanding.

Most disk sanders of the home workshop variety use sanding disks of 5 or 6-in. diameters. These are available in practically all grit specifications, and in open-grit style for removing paint. You can even cut your own disks if the need arises.

Another common type of sander is the vibrator



The first installment on sanding machines, which featured the portable belt exclusively, appeared in the February MI. Here's a roundup of the other types popular with craftsmen.

By Clarence A. Martin

Oscillating unit operates at 75 strokes per second, weighs 5 lbs.

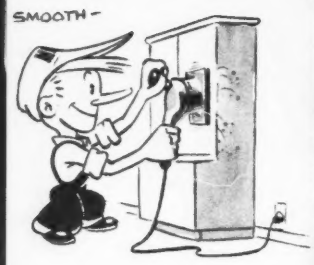
Lightweight vibratory unit insures a smooth finishing surface.

Vibratory sander, like most types, can be converted into a buffer.

Car owners are finding motor-driven sanders indispensable.

Disk sander removes old finishes from wood or metal very rapidly.

Wood is smoothed perfectly; action is similar to hand sanding.



Disk sander becomes an efficient buffer by addition of a bonnet.

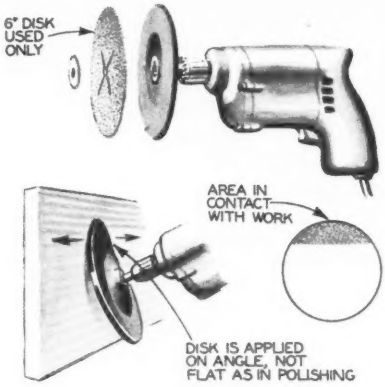
Countless farm operations are simplified with power sanders.

power unit that is activated by the pulsations of alternating current. This moves the abrasive pad at a very rapid rate—14,400 strokes per minute. A lever permits adjustment of this stroke for the most efficient operation.

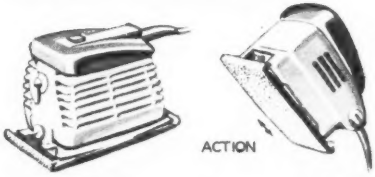
All of the makes of this type of sander are comparatively low priced. They are light in weight, have few moving parts, and require little attention beyond cleaning, since there are no bearings or other wearing parts. At least one company guarantees that their power unit will not burn out during the owner's lifetime.

One vibrating sander features a double arc motion. This combines the best features of orbital and of straight line sanding. Its action also tends to throw off the dust as well as to prevent "loading" of the paper. The straight line reciprocating action of others is claimed to be ideal for finish sanding.

A reactance or vibratory type of sander is excellent for light sanding of furniture, woodwork, cabinets, stairways, etc. A fabric or a buffing [*Continued on page* 156]

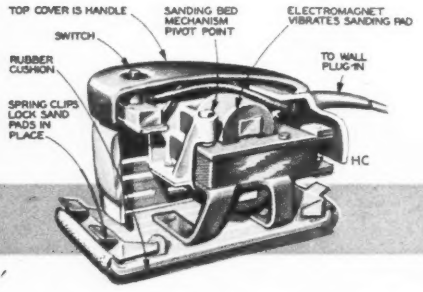


MOST COMMON TYPE OF DISK SANDER IS RUBBER DISK AND PAD SETS INSERTED INTO CHUCK OF ANY 1/4" ELECTRIC DRILL

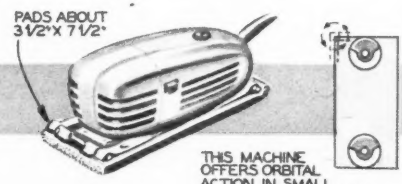


VIBRATION TYPE SANDERS ARE ACTIVATED BY PULSING A C CURRENT RECIPROCATING SAND PAD RAPIDLY

PADS FROM 2 1/2"X 5 1/2" TO 3"X 7"



SECTION THROUGH AN AVERAGE VIBRATION TYPE SANDER

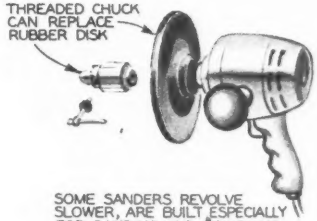


THIS MACHINE OFFERS ORBITAL ACTION IN SMALL ONE HAND OPERATION

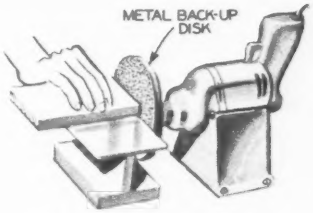
Use progressively finer abrasive in preparing wood for finishing.

If you have a ¼-in. drill, you can get a sanding attachment.

Do not keep disk sander on one spot too long; swirls result.

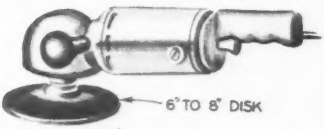


SOME SANDERS REVOLVE SLOWER, ARE BUILT ESPECIALLY FOR SANDING AND POLISHING

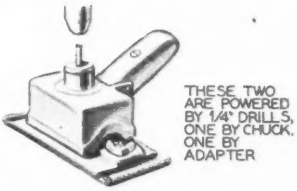


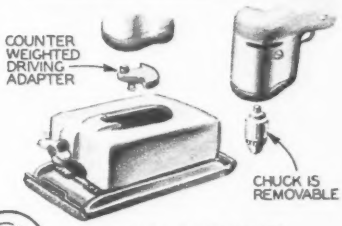
PUT DRILL ON STAND, WORK ON TABLE, AND PRECISE END AND JOINTING SANDING CAN BE DONE

DETACHABLE UNIT IS GEARED FOR SLOW REVOLVING DISK, DRIVEN BY 1/4" DRILL CHUCK

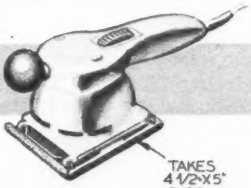


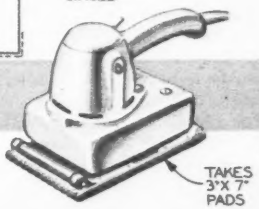
LARGER CAPACITY MOTOR WITH GEAR CASE DOES HEAVY SHOP GRINDING





FOUR TYPICAL NEW TYPE SANDERS WITH ORBITAL ACTION





Space between units has been cleverly utilized by building in a vanity table.

Photo courtesy of Douglas Fir Plywood Assn.

Mr. and Mrs.

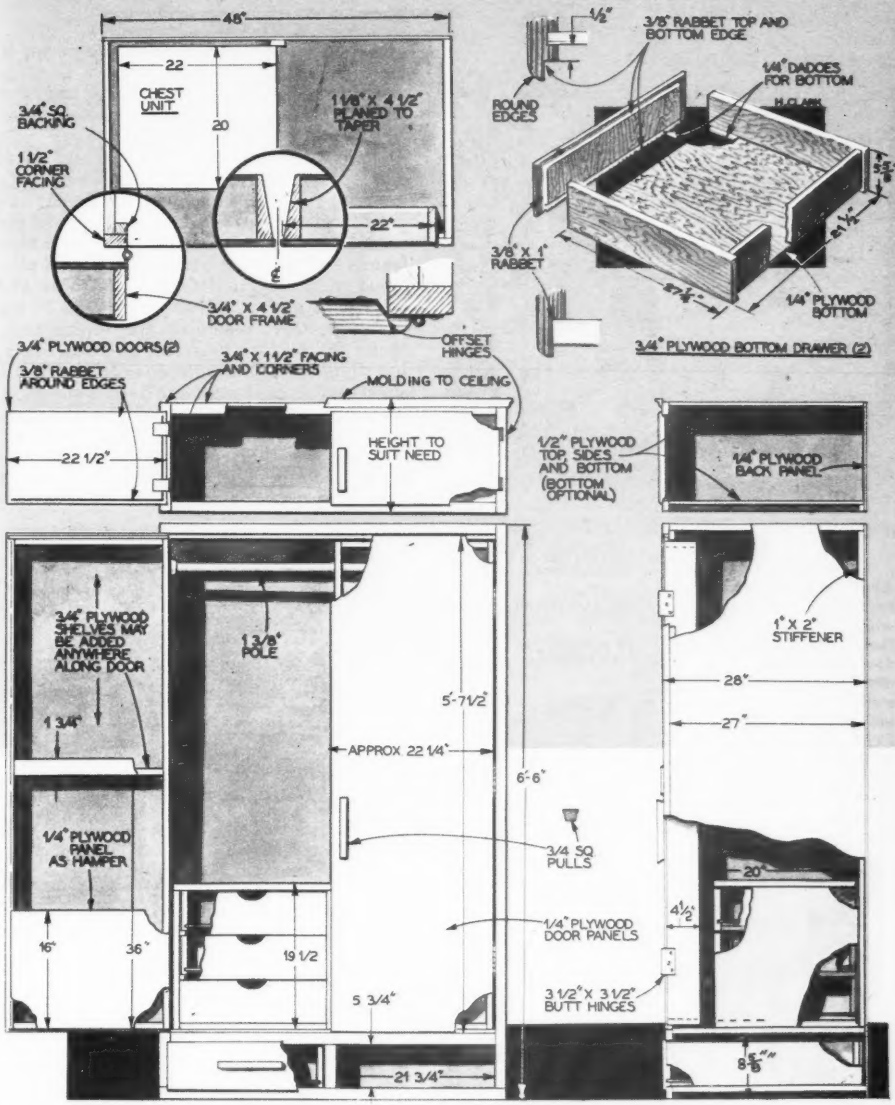
Extending only 28 inches from your wall, these twin units for husband and wife offer ample, accessible storage space.

JUST about every cubic inch of space has been put to work in this twin set of wardrobes. Dimensions will vary somewhat with each installation, but the basic design is applicable in any bedroom. And if you have enough space to build both of them, practically all of your clothing and accessories storage problems will be solved.

The doors, which are framed with 4½-in. stock, have shelves designed to hold handkerchiefs, mufflers, hosiery, sweaters, and costume jewelry or cuff links. The man's unit boasts a built-in tie rack, and both wardrobes contain hampers and ample areas for hanging shoe bags. The bottom drawers, although only about 5 in. deep, will come in handy for underwear, pajamas, etc., while the enclosed compartment on top of the closet is excellent for storing luggage or out-of-season hats and shoes.

An extra dividend, the chest-in-a-chest drawer arrangement, will in many cases dispense with the need for a conventional chest elsewhere in the room. Don't build more than four drawers inside the closet. More than this number will rob you of the space required by hanging garments.

Since most of the measurements are dependent on your own layout, it would be well to study the twin units and the built-in variation shown on page 108. If you find that you don't have sufficient space for the Mr. and Mrs. jobs, then consider the latter. The built-in, if placed in



BILL OF MATERIALS

NOTE: The following materials are required for each wardrobe.

PLYWOOD

3 panels 4 ft. x 8 ft. x 1/4 in. for main doors, shelf faces, back of main unit, drawer bottoms, top bin fronts, etc.
1 panel 4 ft. x 8 ft. x 1/2 in. for sides, top, and bottom of upper unit, and door shelves
3 panels 4 ft. x 8 ft. x 3/4 in. for sides, top, and bottom of main unit; doors of upper unit, drawer fronts, sides, and frame in interior chest

LUMBER

12 ft. 1 1/4x5 in.
20 ft. 1x5 in.
4 ft. 1x4 in.
18 ft. 1x3 in.
42 ft. 1x2 in.
4 ft. 1 3/8-in. dowel for closet pole

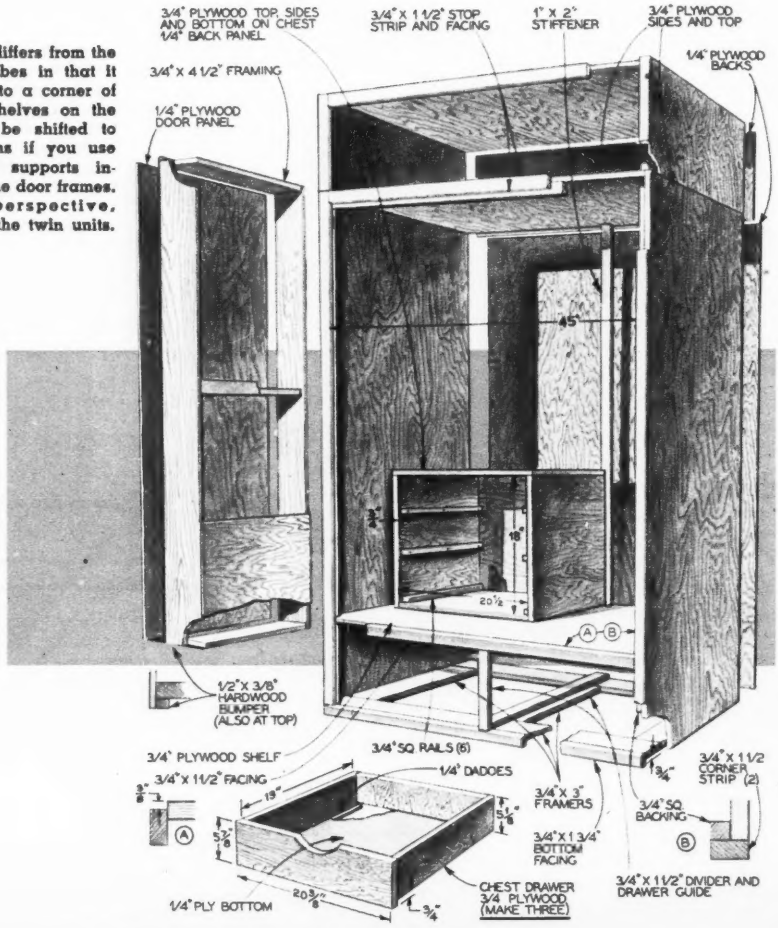
HARDWARE

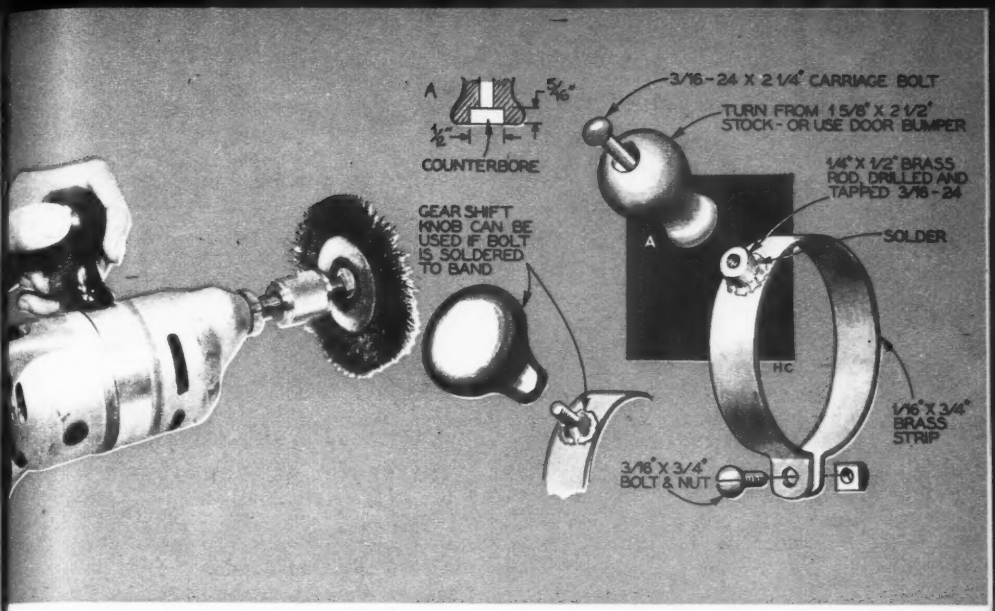
6 3 1/2x3 1/2-in. butt hinges
4 offset hinges
4 spring button catches
16 shelf supports
2 dowel supports
Miscellaneous: finishing nails, screws, sandpaper, finishing materials

one corner of your room, will be easier to make and more economical, too, because it does away with construction of the back and one side, both of which are supplied by the walls of the room.

Now for construction procedure: after determining the size of the space at your disposal, figure out exactly what the dimensions of your wardrobe will be. Begin actual construction by laying out the base framers. Now cut the three horizontal plywood members, and finally the sides and back. Cut and attach the stiffeners to the plywood, then assemble the entire unit. Make the bottom drawers, and the doors, but do not attach the latter until the inside chest and its drawers have been completed. In this manner, you'll be able to position the chest walls and top without interference. Finally attach doors. Finish the unit to match the decor of your bedroom. •

Above unit differs from the twin wardrobes in that it was built into a corner of the room. Shelves on the doors may be shifted to new positions if you use metal shelf supports inserted into the door frames. Exploded perspective, right, is for the twin units.



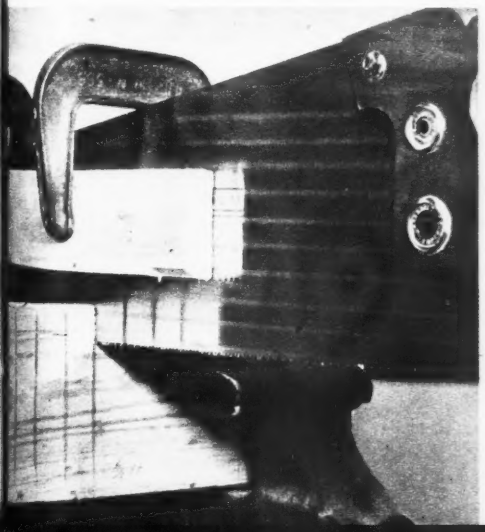


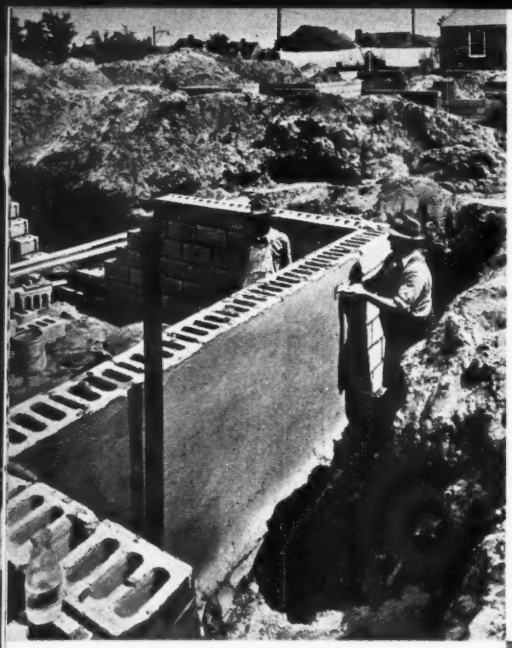
Many portable drills are not equipped with knobs for two-handed control. If your unit is in this category, make this attachment to increase its versatility. Two methods are shown in the sketch: one using a turned knob, the other utilizing gearshift knob.

Craftsman's Corner

Saw guide for making a series of slots of identical depth is easily fashioned by clamping a piece of scrap to the blade so that teeth can cut only to desired depth. Marks scored on blade facilitate setting.

Wandering chuck keys can be kept in check by inserting one end of the key handle in the chuck itself. In this manner, the key will be on the spot and ready for service the next time you want to use it.





Your Home and its Foundation

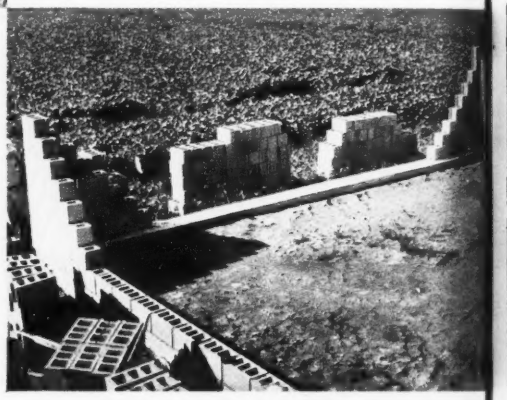
Start at rock bottom in your home planning. The foundation is the key to the ultimate strength of any structure.

By Don Reiman
Sanders, Malsin & Reiman, Architects

THE importance of a sound base for your house cannot be overemphasized. The foundation, though seldom seen, can often be the cause of many a headache for the home owner and a very costly item to repair if not properly built originally. We must remember that the foundation supports the entire weight of the house. It must be stable if the house is to remain level and the walls intact. Three factors determine this stability: (1) the size of the footing must be adequate so that the load is distributed properly to the soil; (2) the footing must be deep enough to prevent disturbance or upheaval by frost; (3) the footing and foundation wall must be strong enough to withstand the weight of the house.

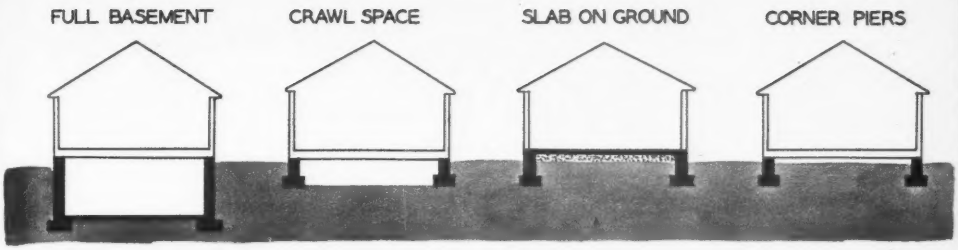
Foundations can be built in many ways, depending on the design of the house. In general, however, they fall into four types: basement, crawl space, slab on grade, or piers.

In the first three cases, the foundation is composed of a wall built of cement blocks or of poured concrete. The wall rests on a poured concrete footing which affords a level surface to work from and keeps the wall above from cracking. The underside of the footing must be below frost line, the depth of which varies with the locality from 18 in. to 4 ft. 6 in., depending on the severity of winter. In general, the walls are 8 in. thick and the footing is 16 in. wide and 10 in. deep. Before discussing each of these types in detail, let's consider the



When erecting a concrete masonry wall, the corners are built up first on a wide concrete footing, after which the walls in between are put up.

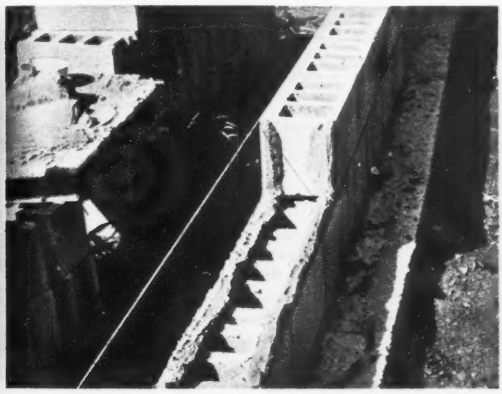
Drain tiles are spaced as shown against the footing. Top half of each joint is covered with tar paper to prevent clogging when backfill is added.



methods and materials which are common to all.

The first step in building any foundation is excavating for the cellar or crawl space. This can be done most quickly and efficiently by a bulldozer after approximate bounds of the house have been marked with corner stakes and the depth of the excavation determined. (The bulldozer may also excavate for fuel and septic tanks at the same time.) Topsoil (about 6 in. deep) should be pushed to one side and saved for regrading before digging into the sub-soil.

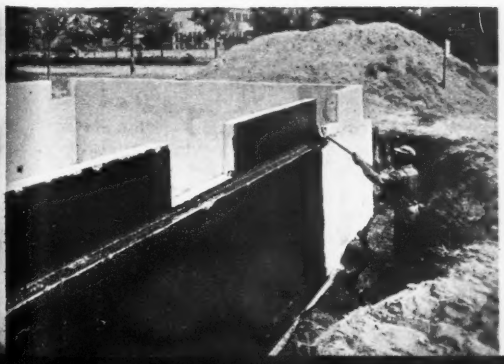
The next step is to erect batter boards and guide lines for digging footing trenches. These trenches are dug by hand. They should be level and square, and approximately 2 ft. wide to allow for working room. Drive a stake into the ground at one corner of the building until the top of the stake is at the desired new grade level. Use



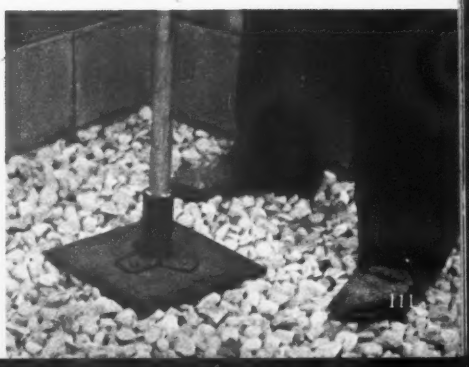
Concrete masonry is laid with both horizontal and vertical face-shell mortar bedding. Note how the mortar is applied and the position of blocks.

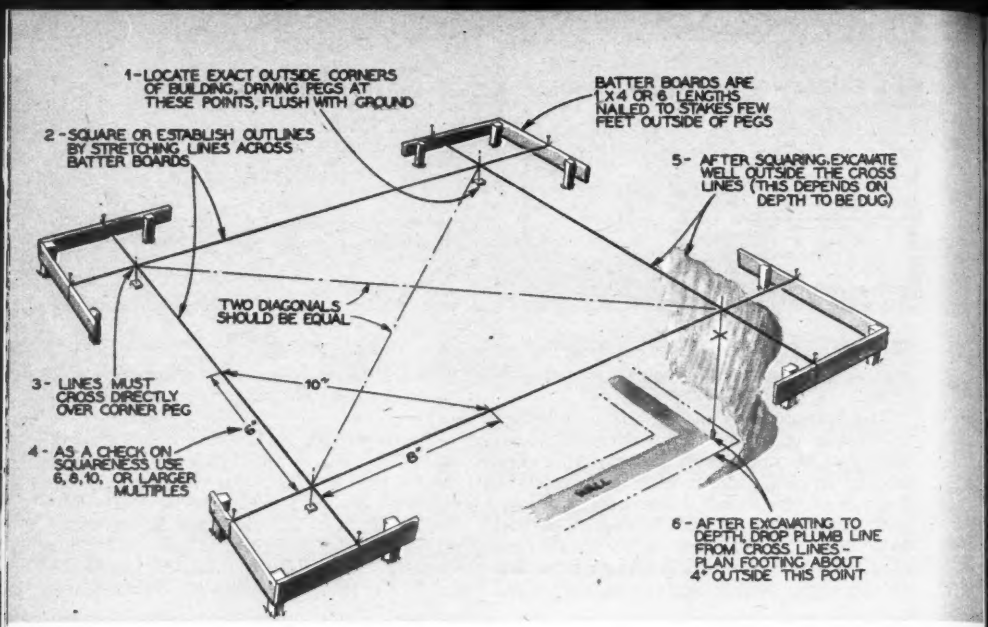
Block is held in this manner when placing, then pushed firmly against the one previously placed. Be sure that you get each block perfectly level.

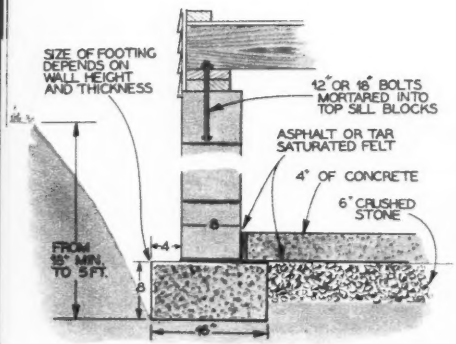
An additional check against moisture in poorly drained soil is an application of hot bituminous material to the outside of basement walls.



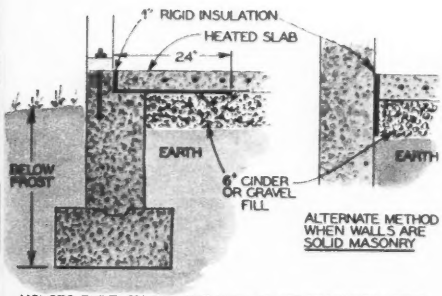
A fill of coarse gravel or crushed rock is applied as the first step in building a warm, dry floor. Tamp it well before pouring your concrete.







ALL FOOTINGS MUST BE LAID BELOW THAT PORTION OF THE GROUND WHICH HEAVES UPWARDS FROM FROST



HOUSES BUILT ON RADIANT HEAT SLABS HAVE INSULATED FOUNDATION TO KEEP FROST FROM CRACKING OR HEAVING SLAB, AS WELL AS TO KEEP HEAT FROM ESCAPING

a finishing nail in the stake to mark the exact corner location. Locate the first batter board 2 ft. from this stake and drive a 1x6-in. stake into the ground. Mark off the height of the foundation wall above grade and calculate the depth of footing required. Drive other stakes as shown in the diagram and fasten 1x6-in. batter boards to stakes at level of top of foundation. Repeat this procedure at other corners. All batter boards should be level with the first set and lines must be square. (Lines are square only when diagonals are equal.)

After digging trenches, use a plumb line to determine the placement of footing forms below. The top of the footing must be level with the line above. If the earth is firm, the trench side may be used as a form.

The materials used are poured concrete for the footing, and poured concrete or concrete blocks and mortar for the walls.

Concrete is composed of sand and gravel held together with a paste made of cement and water. The strength of the concrete depends on the richness of this paste and the amount of water used. For average conditions, a mix is composed of 1 part cement, 2¾ parts sand, and 4 parts gravel plus 7 gallons of water per bag of cement. If the sand used is wet, the amount of water should be decreased to 5 or 6 gallons. A pail may be used to make measurements. A good rule to remember is: the more water used, the weaker the concrete.

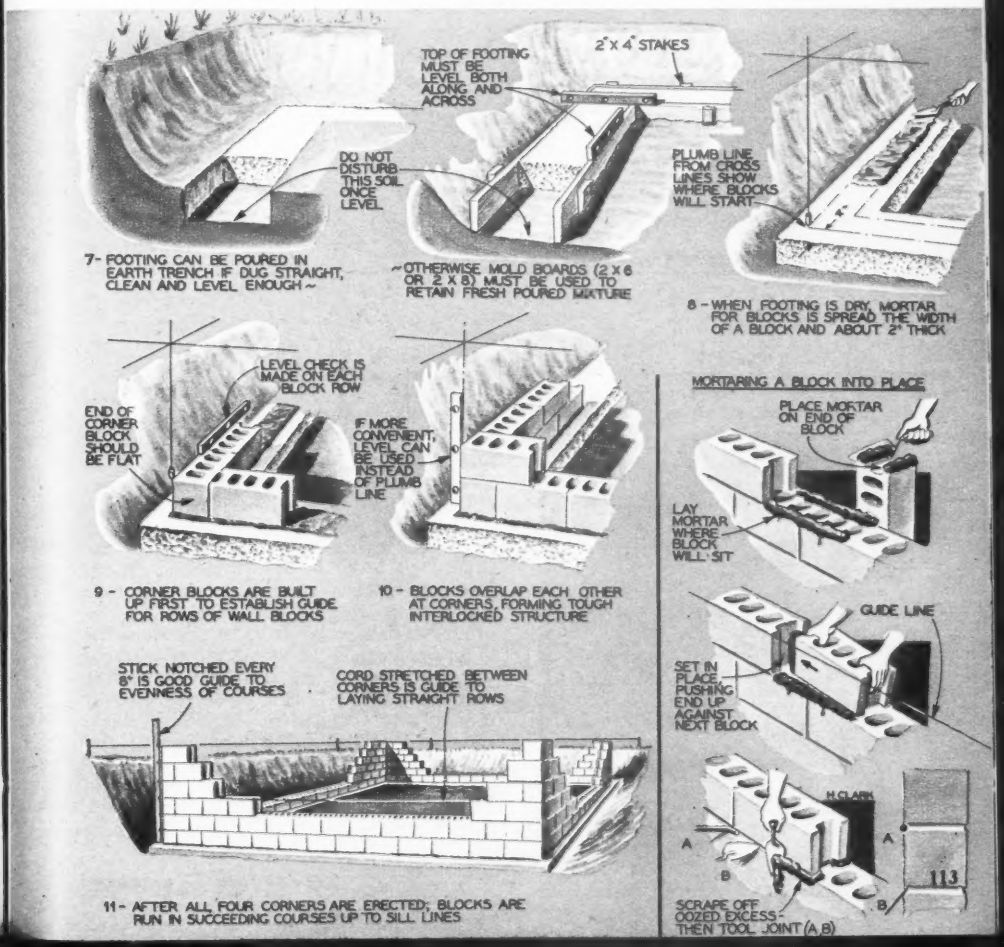
The sand and gravel must be clean, hard, well graded, and free from any organic matter, as this weakens the cement by

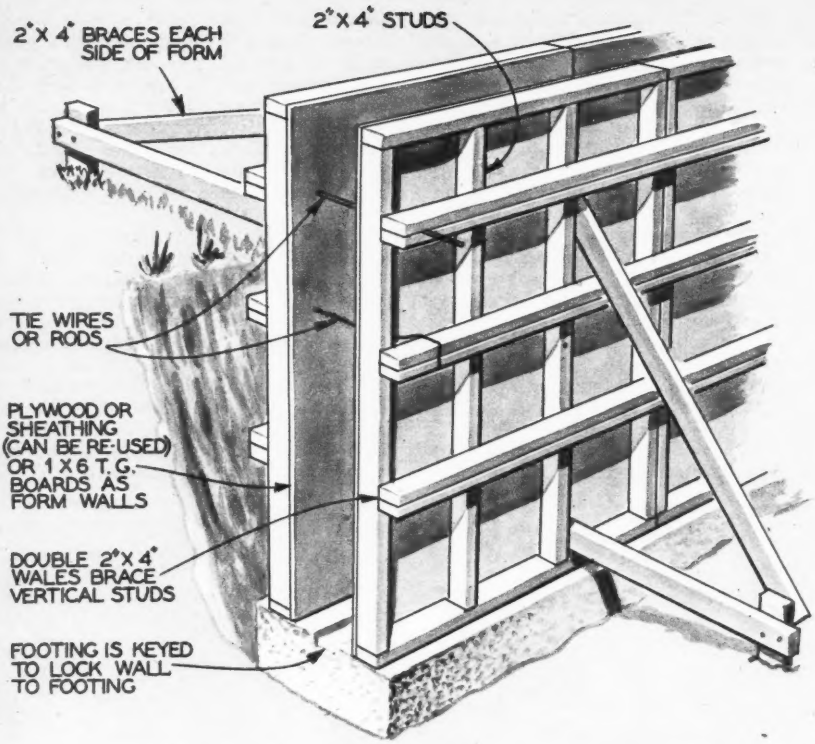
coating the particles of sand and gravel and preventing a proper bond with the cement. Measure materials carefully by volume and use only clean water. Mix only enough concrete to last two or three hours. The cost of ready-mixed concrete may be well worth the time and labor saved. Allow footing to set for two or three days before starting the wall. If it is a poured concrete wall, the same mix used for footings is again used and a form built to contain the wall. The forms must be properly braced to withhold the weight of the wet concrete. If the earth is firm, the trench sides may be used as forms. Spading of concrete along the form faces helps attain smooth, watertight concrete walls.

Most residential foundation walls today are built of cement blocks, for the added labor and materials in making forms is costly. The blocks are held together by cement mortar composed of 1 part Portland cement, 1 part hydrated lime, and 4 to 6 parts of sand. The same rules of accurate measurement and cleanliness of materials for concrete apply to mortar as well. Concrete blocks are available in many sizes but the block most commonly used is 8x8x16 in. Special blocks for corner, jambs and half-length units are manufactured. Thin joints must be used to insure weathertight walls.

Before starting, it is important that the footing be level and straight. Build the corners and then fill in between them as shown. In order to insure tight waterproof joints, the mortar should be compressed with a V or U-shaped tool after it has partially set.

Now let's get down to the specific types. When constructing a basement, the footings and walls are built as described above. However, certain added precautions must be taken to insure a dry basement. The soil





ERECTION OF WOODEN FORM FOR POURING SOLID CONCRETE WALLS

Basement floor should be concrete not less than 4 in. thick. Space left between the floor and the wall is later filled in with mastic material.

around the wall should be graded so that it carries off surface water. Unless good drainage conditions are encountered, a footing drain should be placed above the footing to lead to a proper drain. This is made of footing tile with open joints.

The top half of each joint is covered with tar paper to prevent clogging of the pipe when the trench is backfilled. The tile should pitch ½ in. per 12 ft. and should never be placed lower than the footing. Cover tile with 18 in. of crushed stone or gravel and then backfill. In addition, the exterior surface of the wall should be waterproofed by either of the following methods: (1) If it is a block wall, cover it with two coats of mortar ¼ in. thick, composed of 1 part Portland cement and 2½ parts sand. Moisten wall surface, apply first coat, then allow to dry 24 hours; moisten again and apply the second coat. An admixture of Anti-hydro or other such

agent may be used to increase the waterproof quality; (2) Cover exterior surface of blocks with bituminous coating to grade. If the wall is constructed of poured concrete, use a water-proofing agent in the mix. Remember that it is more difficult to waterproof a wall from the interior. Therefore, the proper precautions must be taken before the wall is backfilled. Do not backfill until first-floor joists are in place.

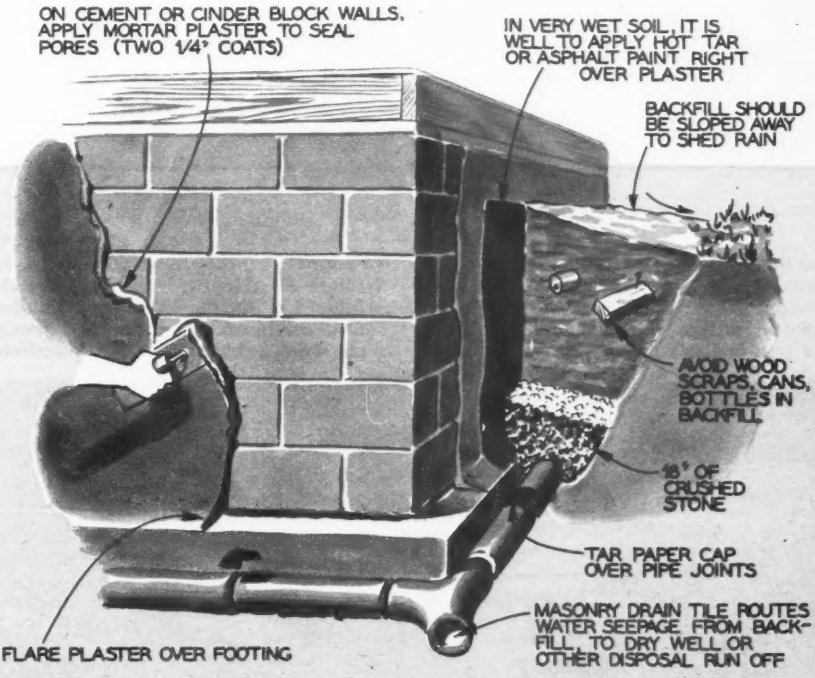
The basement floor itself should be placed on 6 in. of gravel or cinder fill over which a roofing felt has been laid to act as a moisture barrier. This felt also prevents the water in the concrete from draining out too soon. The mix used for the slab is the same as that described for footings. The slab may be finished in several ways, depending on the desired texture. Troweling with a wood float gives a gritty non-skid surface. A hard, smooth and dense surface is the product of steel troweling. A broom finish is used when more than normal traction is desired. In order to cure properly, new concrete should be covered with wet straw or burlap and should be protected from drying for about five days.

In constructing the crawl space, our second foundation type, the same type of wall described above is used, but this wall is seldom waterproofed unless soil conditions warrant it. The footing drain should, however, be used to carry off any excess water and the joints should be small and tooled.

Should the house be of frame construction, the ½-in. steel anchor bolts used to hold the sills in place should be placed in the cell of the block approximately 8 ft. on centers and the cell filled with mortar. The wood sill should have ½ in. of cement grout (thin mortar) as a level-setting bed between it and the block below. The "floor" of the crawl space should be covered with roofing felt in order to prevent ground moisture from rising into the house.

In northern latitudes, the slab on grade, our third style, requires a foundation wall around the periphery, primarily as a guard against frost. One of the most important considerations is placing a slab which is exposed to the cold transmitted through the foundation wall. It is most important that this slab edge be well insulated. The construction of the slab itself is similar to that described above for the slab in the basement.

Finally, we have the style utilizing pier construction. The [*Continued on page* 158]



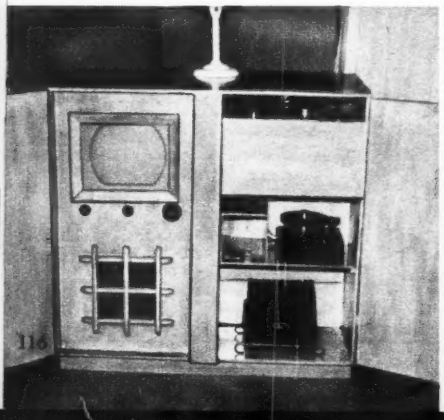
WATERPROOFING OUTER WALLS IS BEST SAFEGUARD AGAINST BASEMENT DAMPNESS

Mr. Mulligan, built by Edward A. Varca of New York, is powered by a .60 engine and has a 36-in. wing span. The little boy is a cut-out photograph of Mr. Varca's son, placed near the model for a startling effect.

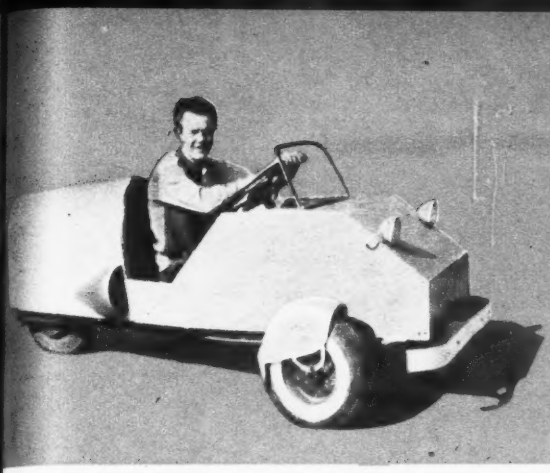
mi WORKBENCH AWARD WINNERS

Each craftsman whose project is shown here receives a $5 check and a Workbench Award Certificate. How about sending us a photo and description of your latest project? If you aren't a winner, you may still receive a Certificate Of Merit. Photographs of your workshop are also eligible for an award. Send entries to MECHANIX ILLUSTRATED Workbench Awards, 67 West 44th Street, New York 36, New York.

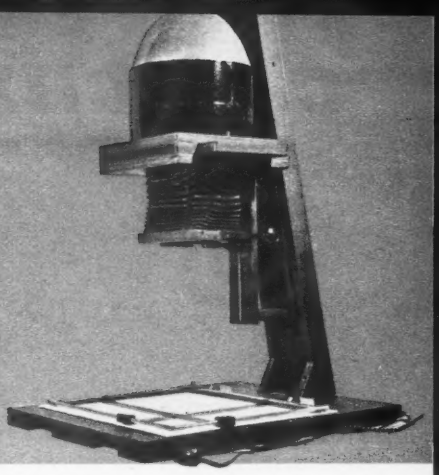
Console combination, featuring TV, wire recorder, 45 rpm phonograph and storage space, was built in one week, by Thomas Buttera of Mundelein, Ill. Pine and plywood cabinet was finished blond.



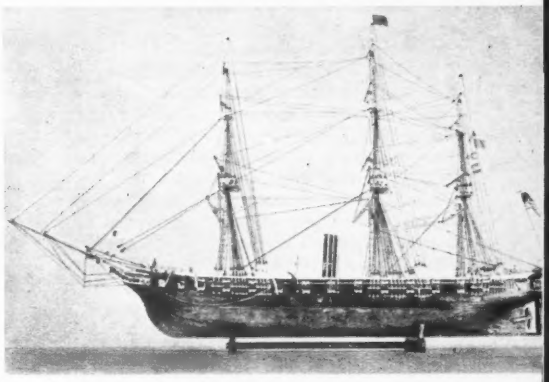
Li'l Putt, MI plan No. B-170, was built by William J. Alvey of Allegany, Ore. He writes, "Li'l Putt has done everything you said it would and then some." It does 30 mph with a Mercury 7½ hp outboard.



Three wheel car. took Bob Bradin of Pomona, Calif., one year to build and cost him $130. It has scooter wheels, a sheet metal body and Ford steering. Wind scoops cool the 5½ hp motor; top speed: 68 mph.

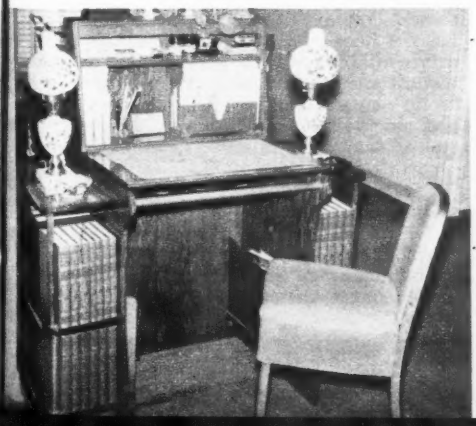


Condenser enlarger, built by R. L. Grimm of Denver, takes negatives up to 4x5 and cost $15 to build. The lamp house is made of a 10-in. photoflood reflector mounted on an empty 5-pound Dektol can.



Hartford. Admiral Farragut's Flagship, was built by Oscar Claessens of Stone Lake, Wis. It took two years to build and has a hollow hull made of hardwood veneer over mahogany planking, fastened with screws.

Utility desk, designed for use in apartments with limited space, was built by E. D. Kittinger of Dallas. It features an extra-large drawer and fold-up top which covers storage space housing stationery supplies.



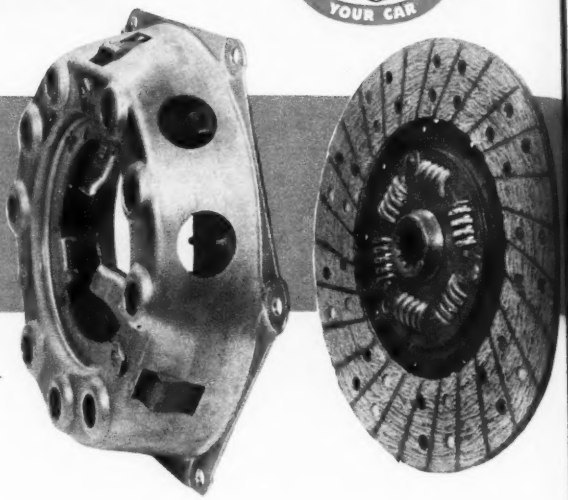
H O Pike. 7x8 ft. was constructed by George M. Blanck of Devon, Conn. Built on ¾-in. plywood, it has a switchboard equipped with a volt and ammeter and control blocks for freight and passenger trains.

car care

CARE WILL SAVE YOUR CAR

The Clutch

By Frederick C. Russell



Close-up of cover assembly and plate of Borg & Beck 9 A-6 clutch showing dampener springs used to help ease shock of engagement.

HARD working, simple in theory but complicated in detail, the clutch continues to be one basic unit of the automobile that still needs grasping. While rapid disappearance of the clutch pedal seems to be pushing the clutch into the background, even in automatic transmissions, torque converters and fluid drives it continues to play a major role. A car that couldn't be backed up or idled would be about as useful as a piano that couldn't play sharps or flats—so the clutch continues to be in the picture even though it may be unseen and completely automatic.

All these years of throwing out the clutch appear to have merely demonstrated its indispensability. But one of the things that has resulted in its being such a troublesome unit over the years is that car owners have somehow failed to keep pace with its changing design. There has also been a strange habit of blaming the clutch for a lot of ills that should rightly be placed at the doorstep of the car's other major units.

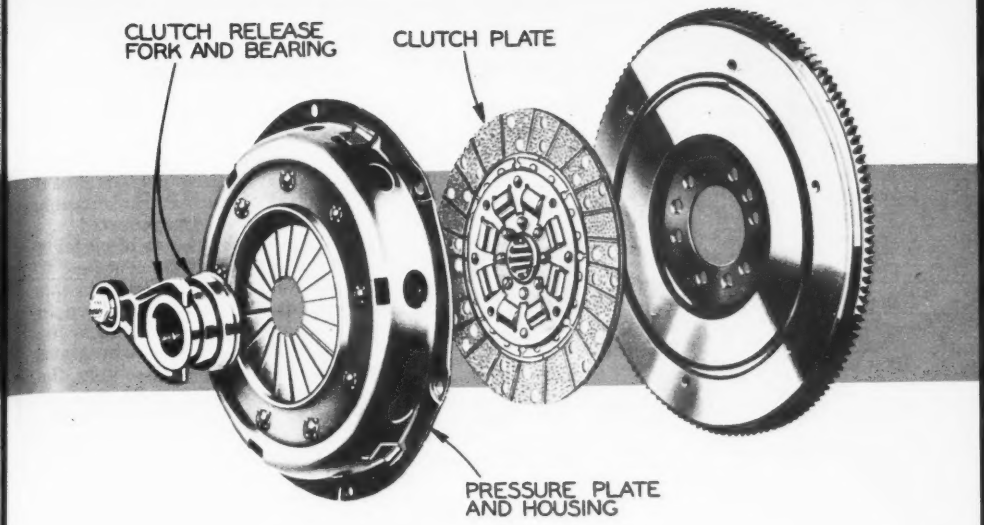
One owner immediately suspected that the clutch was slipping because the car lost power on hills. He did not realize that the fuel pump was simply failing to provide enough gasoline. Another blamed the clutch because of the excessive shake in the drive line when reversing the car. This turned out to be need for a new set of universal joints. Right now millions of car owners are complaining because of excessive chatter. They are so sure it is due to the clutch they never bother to suspect that the motor may need new mounts or a new exhaust system.

It helps to realize that the clutch is merely a coupling and that slippage is a normal function of its action. If it took hold without any slippage the coupling would be too abrupt. Few remember that in the early days of motoring one of the most unhappy incidents was to have the clutch fail to disengage. That was when clutches were the cone type. I remember being so engrossed in the Berkshire scenery that I drove the first ten miles without declutching. As I entered Pittsfield, Mass., the engine could not be "broken" from the transmission. It took four hours to get the driven member out of the cone and to smooth the leather facings with neat's foot oil. What a thrill when the industry switched to the plate type of clutch!

This type has somehow managed to survive despite its defects. While it offers some advantages the multiple disk clutch has not been widely used in conventional drives although it is the form used in automatics and torque converters where a "solid" connection is needed for reverse and emergency low. Hudson is the only maker using a multiple disk clutch running in oil.

Speaking of smoothness brings up the matter of driving. Due to great power and faster traffic motorists have become quite accustomed to getting away briskly. Drivers who engage the clutch faster while feeding more gas invariably get off with

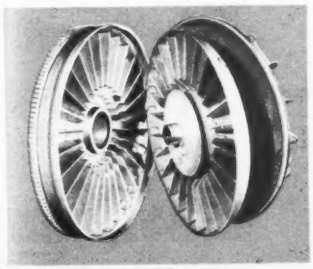
Photos courtesy of Russell Mnfg. Co. and General Motors.

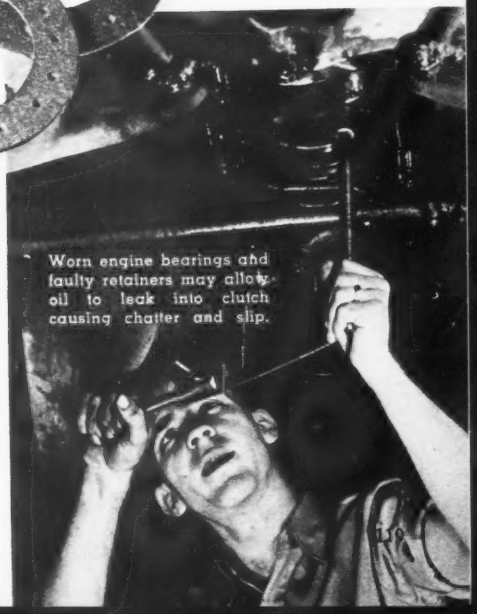


Exploded view of Chevrolet assembly showing clutch plate positioned between flywheel face and cover.

Clutch facings may be made of fused fabric or molded as shown at left.

Automatic transmissions use the primary principal of a driver and a runner with fluid pressure instead of friction to provide the coupling. On Chrysler semi-automatic drives there's a mechanical clutch plate behind the fluid drive.





Worn engine bearings and faulty retainers may allow oil to leak into clutch causing chatter and slip.

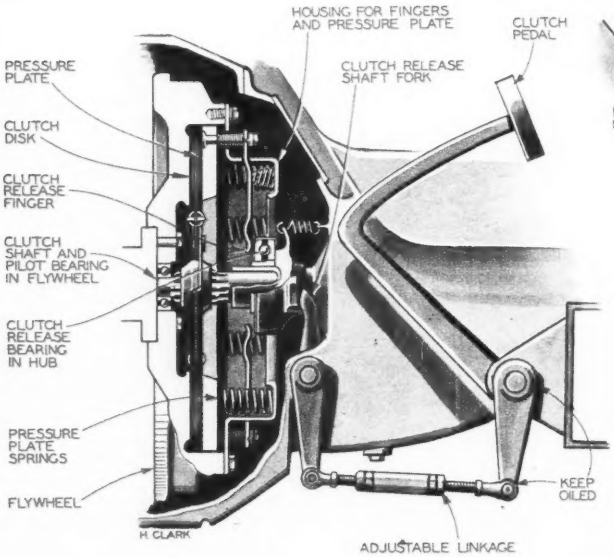
less tendency for chatter. The clutch may actually grab but the very abruptness of the start serves to cover this up. At the other extreme is the driver who babies his car too much. He lets the clutch pedal up gingerly and doesn't feed enough gas. Unless the clutch happens to be extremely smooth, and the engine both smooth and powerful, there will be violent chatter. The engine may die and the whole car shake.

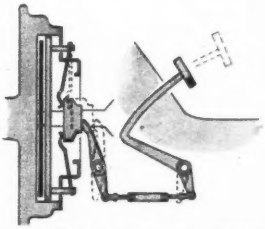
Plenty of other reasons for chatter should be considered, as I'll show presently, but the too solicitous handling of the starting process is the top offender. Clutches are roughly divided into fast and slow types. Actually it is largely a matter of the pedal position at which complete engagement is obtained. This difference must be understood by the driver. With a fast clutch the engine is fully coupled when the pedal is up a few inches from the toeboard, whereas with a slow clutch there is no complete engagement until the pedal is almost all the way up. Drivers with fast clutches are apt to damage the rear end or stall the engine. Those with the slower type are likely to slip the clutch and warp the plate or plates, especially when shifting gears with the foot on the pedal most of the time.

There should be about one inch of free play in the clutch pedal's travel. That is, the pedal should go down about this distance before the clutch starts to disengage. Some manufacturers recommend more clearance here. This play is adjustable in the pedal linkage, and unless maintained, the clutch facing will wear abnormally. All other adjustments to the clutch have to be done when the unit is disassembled which means expense, trouble and time because the transmission has to be removed in order to get at it. On some cars both front and rear universals have to be disconnected. And if the parking brake is on the transmission, this too will have to be disconnected.

With so many different kinds of clutches on American cars it would be senseless to attempt to give details of servicing in this limited space, but some general rules ought to fit into the picture. One of these is the importance of marking the flywheel and clutch cover so that, after re-assembly, the original balance is maintained. That funny vibration in the car after Joe finishes a hasty job may mean that the matter of balance has been skipped. Joe may have used the original pressure plate and clutch cover without having punch-marked the parts for re-assembly in the same position.

Much trouble results from failure to replace the clutch springs that have been weakened by overheating. Clutches generate heat from their own slippage, and in addition they are located where they pick up heat from the engine. Plates that have been warped through overheating will also have to be replaced. Release levers and struts vary widely in detail, but working edges should have a little special lubricant. Careful lever adjustment is extremely important in clutch work. Sometimes there is a [*Continued on page* 152]

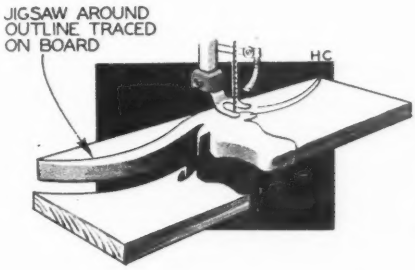


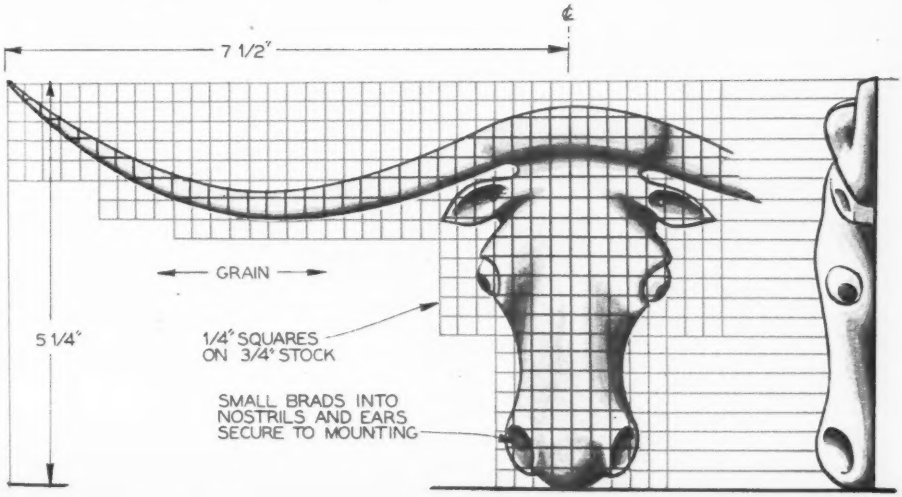


WHEN PEDAL IS DEPRESSED, PRESSURE PLATE IS PULLED BACK BY FINGERS LEAVING CLUTCH IDLE OR FREE WHEELING

LONGHORN CARVINGS

HERE'S a pair of reminders of old Texas, where the longhorns used to roam. Each head is carved from a ¾x6x16-in. piece of pine. Make a full-size drawing, using the grid as a guide, and transfer it to the stock. Cut it out with a jig or coping saw and shape it with a jackknife, a rat-tailed file, a small half-round file, and a small woodcarver's gouge. Work carefully when shaping the ears or they may break off. The work can be clamped in a wood vise while being roughed out, but should be held in your hand while doing the delicate finish work. Sand each head when completed and mount it on a wooden plaque, securing it with brads through the nostrils and ears. A wax finish will protect your work.—*C. W. Wright.* •





PT-810

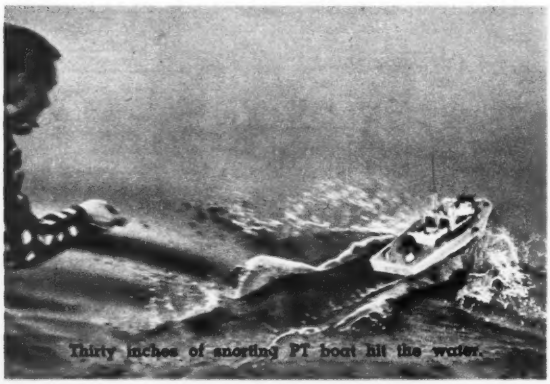
WORTHY successors to the graceful wooden PTs of World War II, the new all-aluminum PT boats are larger, have much heavier armament and employ special welding and riveting construction methods.

By "guesstimation" a fairly accurate replica has been built, but the exact dimensions are still a Navy secret. Scale is about ⅜ in. to the foot; length of the model is 30 in.

The hull is built with plywood frames, hard balsa stringers, plywood planking and block balsa bow. All superstructure is block and sheet balsa to keep topside weight to a minimum. The low position of the engine and batteries in the hull makes for very stable riding. Power plant is the O & R .29 marine engine; an O & R coupling shaft and a 2 in. diameter with a 2 in. pitch propeller are used. Speed is judged to be about 15 mph.

Radio used is a standard Radio Control Headquarters RK-61 receiver. Batteries required are 45-volt "B", RCA VS-055 or Eveready 467, while two medium flashlight cells are used for "A" power; the rudder servo uses two medium cells. Full weight of the craft is five pounds, three ounces.

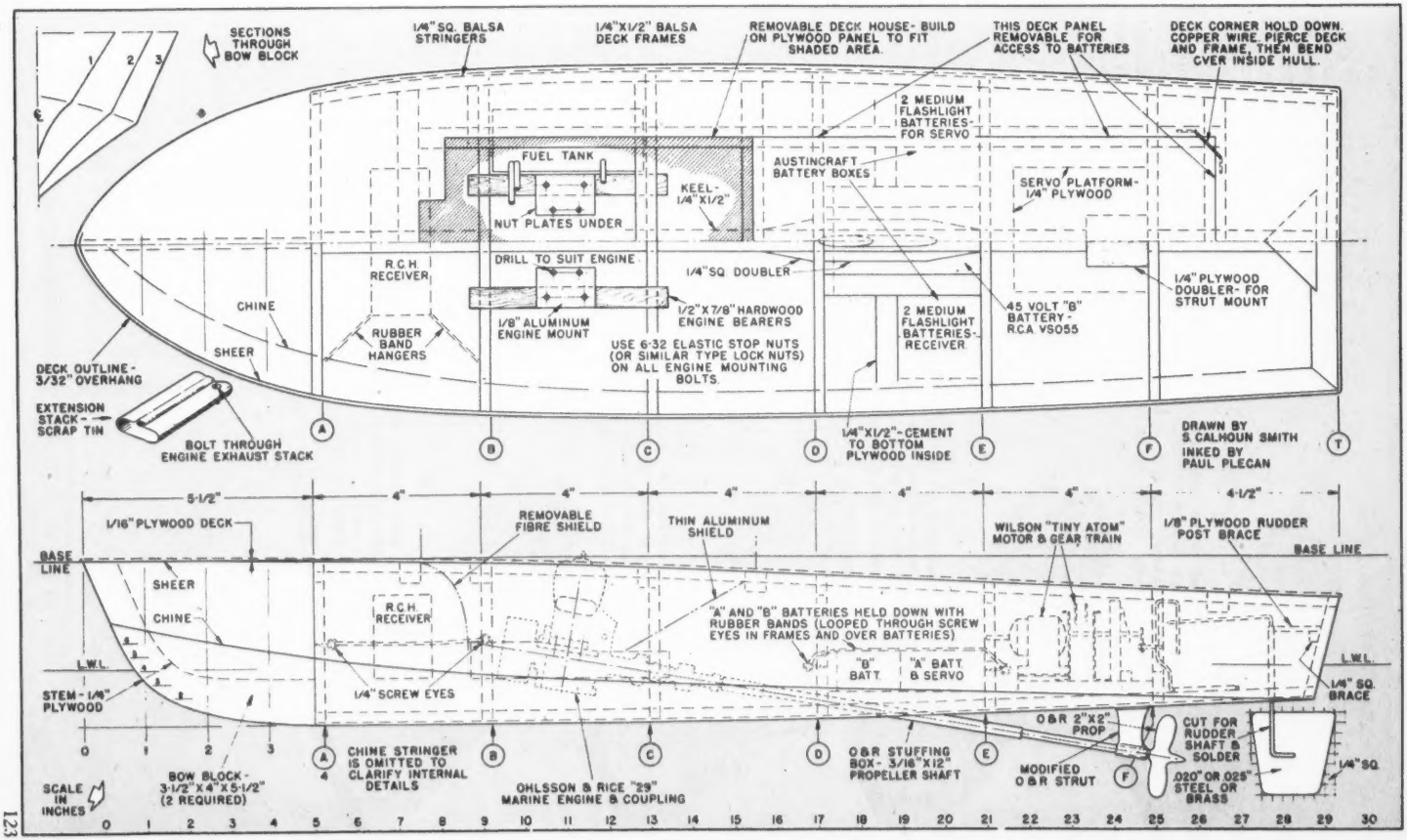
The self-neutralizing rudder servo idea, which does the job very well, is borrowed from our English friends. The original unit shown in the photos utilizes the "Tiny Atom" electric motor and gear train which can be purchased as a kit. Lowest reduction gear ratio was used and 1½ volts turn the crank so that the rudder moves from neutral to right or left in slightly



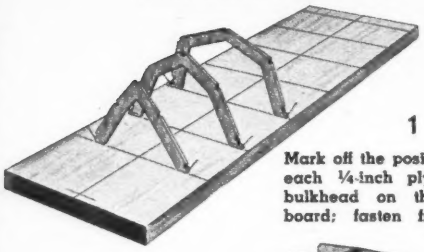
Thirty inches of snorting PT boat hit the water.

This radio-controlled job has everything a boat fan could want — accuracy, speed, remote handling.

By Cal Smith

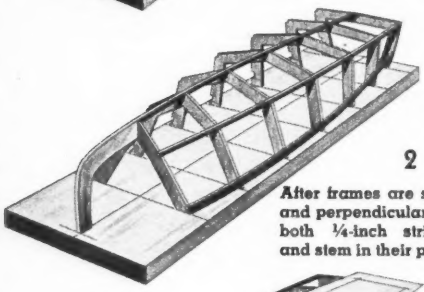

SECTIONS THROUGH BOW BLOCK
1/4" SQ. BALSA STRINGERS
1/4"X1/2" BALSA DECK FRAMES
REMOVABLE DECK HOUSE- BUILD ON PLYWOOD PANEL TO FIT SHADED AREA.
THIS DECK PANEL REMOVABLE FOR ACCESS TO BATTERIES
DECK CORNER HOLD DOWN. COPPER WIRE. PIERCE DECK AND FRAME, THEN BEND OVER INSIDE HULL.
2 MEDIUM FLASHLIGHT BATTERIES- FOR SERVO
FUEL TANK
AUSTINCRAFT BATTERY BOXES
KEEL- 1/4"X1/2"
SERVO PLATFORM- 1/4" PLYWOOD
NUT PLATES UNDER
DRILL TO SUIT ENGINE
R.C.H. RECEIVER
1/4"SQ. DOUBLER
1/4" PLYWOOD DOUBLER- FOR STRUT MOUNT
CHINE
1/8" ALUMINUM ENGINE MOUNT
1/2"X7/8" HARDWOOD ENGINE BEARERS
2 MEDIUM FLASHLIGHT BATTERIES- RECEIVER
45 VOLT "B" BATTERY- R.C.A. VS055
RUBBER BAND HANGERS
USE 6-32 ELASTIC STOP NUTS (OR SIMILAR TYPE LOCK NUTS) ON ALL ENGINE MOUNTING BOLTS.
SHEER
DECK OUTLINE- 3/32" OVERHANG
EXTENSION STACK- SCRAP TIN
BOLT THROUGH ENGINE EXHAUST STACK
1/4"X1/2"- CEMENT TO BOTTOM PLYWOOD INSIDE
DRAWN BY S. CALHOUN SMITH
INKED BY PAUL PLECAN
5-1/2"
4"
4"
4"
4"
4"
4-1/2"
1/16" PLYWOOD DECK
REMOVABLE FIBRE SHIELD
THIN ALUMINUM SHIELD
WILSON "TINY ATOM" MOTOR & GEAR TRAIN
1/8" PLYWOOD RUDDER POST BRACE
BASE LINE
BASE LINE
SHEER
CHINE
R.C.H. RECEIVER
"A" AND "B" BATTERIES HELD DOWN WITH RUBBER BANDS (LOOPED THROUGH SCREW EYES IN FRAMES AND OVER BATTERIES)
L.W.L.
L.W.L.
"B" BATT.
"A" BATT. & SERVO
STEM- 1/4" PLYWOOD
1/4" SCREW EYES
1/4" SQ. BRACE
O&R 2"X2" PROP
CUT FOR RUDDER SHAFT & SOLDER
CHINE STRINGER IS OMITTED TO CLARIFY INTERNAL DETAILS
O&R STUFFING BOX- 3/16"X12" PROPELLER SHAFT
MODIFIED O&R STRUT
1/4" SQ.
.020" OR .025" STEEL OR BRASS
BOW BLOCK- 3-1/2"X4"X5-1/2" (2 REQUIRED)
OHLSSON & RICE "29" MARINE ENGINE & COUPLING
SCALE IN INCHES
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

HULL CONSTRUCTION



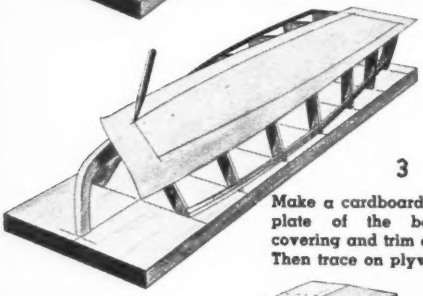
1

Mark off the position of each ¼-inch plywood bulkhead on the jig board; fasten frames.



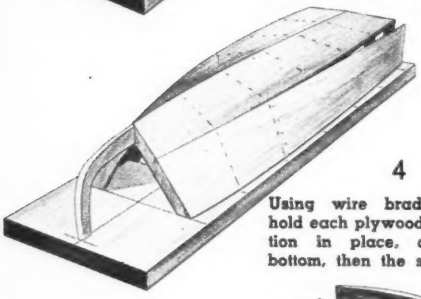
2

After frames are secure and perpendicular, glue both ¼-inch stringers and stem in their places.



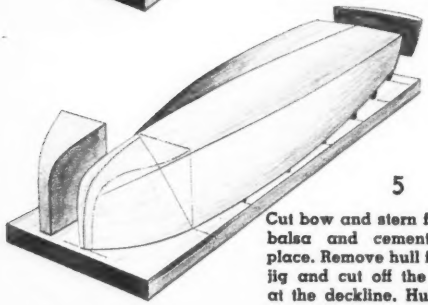
3

Make a cardboard template of the bottom covering and trim edge. Then trace on plywood.



4

Using wire brads to hold each plywood section in place, cover bottom, then the sides.



5

Cut bow and stern from balsa and cement in place. Remove hull from jig and cut off the top at the deckline. Hull is now set for the mounts.

under one second. This timing makes the boat roll in and out of turns very smoothly without jerking. The rudder drive used is similar to an escapement, in that the action sequence must be followed. The rudder moves from neutral to left to right to neutral and repeat; so it is necessary to turn the rudder through right if two left turns are to be made in succession. No difficulty is experienced since it only takes a few seconds to run through the sequence.

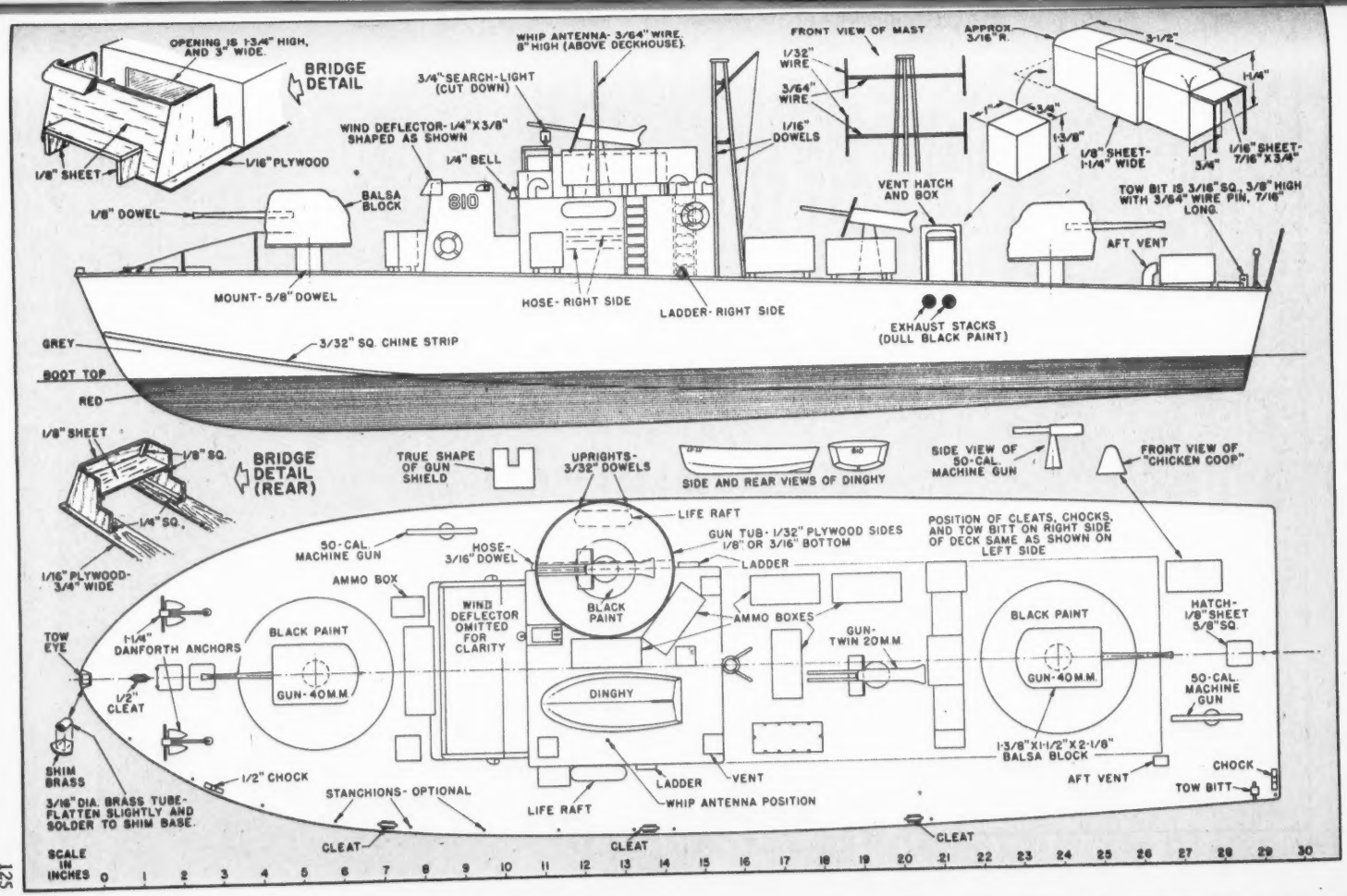
Instead of using a push-button switch at the transmitter, a rotary selector switch is substituted. A worked-over eight-position type switch was used, a four-position type being needed. The depressions in the selector cam are ground down so that the action is free and smooth but still holds position. Switch wires to the transmitter are soldered to horizontally opposite contacts. The pointer knob is lined up over the contact wiper so that switch-on position corresponds to right or left. The selector switch is mounted in a plastic cheese box with the switch-off position vertical and switch-on horizontal.

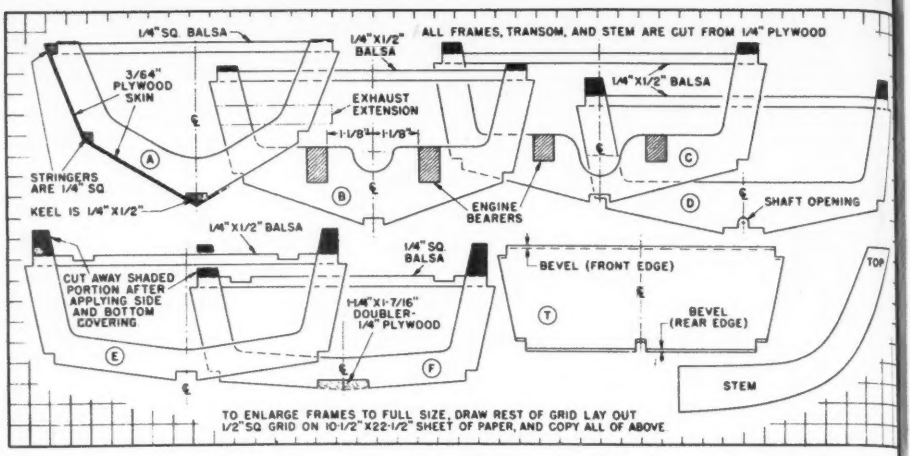
Large red dots were painted on the box at the 12, 3, 6 and 9 o'clock spots to correspond with the switch and pointer positions. The pointer is always turned in the same direction, so control selector then indicates the corresponding position of the rudder in the boat and shows which direction turn is up next. The action of the servo motor follows this sequence: neutral is signal off; signal on (transmitter control pointer to left) moves rudder to left and holds left rudder as long as signal is left on. Signal off (pointer to neutral) moves rudder to neutral. Next signal-on (pointer to right) moves rudder to right, holding until signal is turned off. Moving pointer to neutral gives signal off, returning rudder to neutral. The cycle is then ready to repeat. To synchronize control and rudder at beginning of a run, turn control through a couple of steps. If control and rudder do not correspond, simply move control back one position and then signal and response will be synchronized.

The boat turns tighter to the right than to the left. This is because of prop torque and turbulence. The rudder travel can be

FULL-SIZE PLANS

will greatly simplify construction. Send $1.50 to MECHANIX ILLUSTRATED Plans Service, Fawcett Building, Greenwich, Conn. Plan. No. 1015.

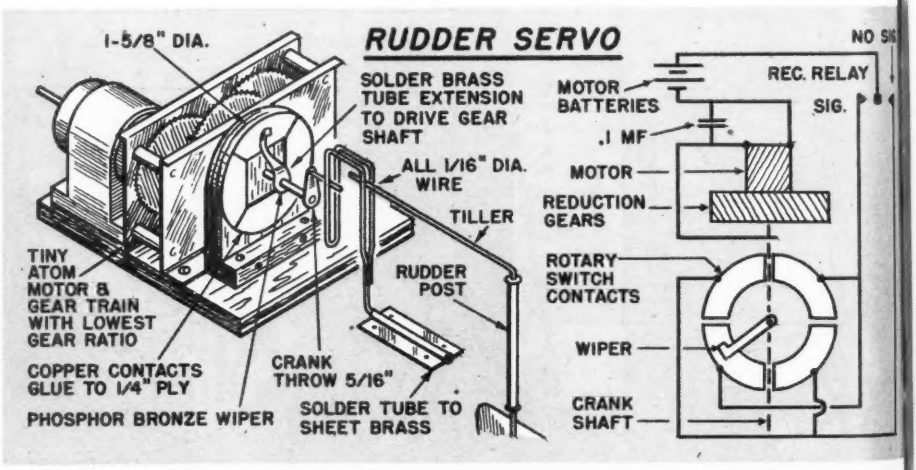

OPENING IS 1-3/4" HIGH, AND 3" WIDE.
BRIDGE DETAIL
1/8" SHEET
1/16" PLYWOOD
1/8" DOWEL
BALSA BLOCK
WHIP ANTENNA- 3/64" WIRE, 8" HIGH (ABOVE DECKHOUSE).
3/4" SEARCH-LIGHT (CUT DOWN)
WIND DEFLECTOR- 1/4" X 3/8" SHAPED AS SHOWN
1/4" BELL
810
MOUNT- 5/8" DOWEL
HOSE- RIGHT SIDE
LADDER- RIGHT SIDE
GREY
3/32" SQ. CHINE STRIP
BOOT TOP
RED
FRONT VIEW OF MAST
1/32" WIRE
3/64" WIRE
1/16" DOWELS
VENT HATCH AND BOX
EXHAUST STACKS (DULL BLACK PAINT)
APPROX. 3/16" R.
3-1/2"
1-1/4"
1-3/8"
3/4"
1/8" SHEET- 1-1/4" WIDE
1/16" SHEET- 7/16" X 3/4"
TOW BIT IS 3/16" SQ., 3/8" HIGH WITH 3/64" WIRE PIN, 7/16" LONG.
AFT VENT
1/8" SHEET
1/8" SQ.
BRIDGE DETAIL (REAR)
1/4" SQ.
1/16" PLYWOOD- 3/4" WIDE
TRUE SHAPE OF GUN SHIELD
UPRIGHTS- 3/32" DOWELS
SIDE AND REAR VIEWS OF DINGHY
SIDE VIEW OF 50-CAL. MACHINE GUN
FRONT VIEW OF "CHICKEN COOP"
LIFE RAFT
GUN TUB- 1/32" PLYWOOD SIDES 1/8" OR 3/16" BOTTOM
POSITION OF CLEATS, CHOCKS, AND TOW BITT ON RIGHT SIDE OF DECK SAME AS SHOWN ON LEFT SIDE
50-CAL. MACHINE GUN
HOSE- 3/16" DOWEL
LADDER
AMMO BOX
WIND DEFLECTOR OMITTED FOR CLARITY
BLACK PAINT
AMMO BOXES
GUN- TWIN 20 M.M.
BLACK PAINT
HATCH- 1/8" SHEET 5/8" SQ.
TOW EYE
1-1/4" DANFORTH ANCHORS
BLACK PAINT
GUN- 40 M.M.
1/2" CLEAT
DINGHY
GUN- 40 M.M.
50-CAL. MACHINE GUN
1-3/8" X 1-1/2" X 2-1/8" BALSA BLOCK
SHIM BRASS
1/2" CHOCK
3/16" DIA. BRASS TUBE- FLATTEN SLIGHTLY AND SOLDER TO SHIM BASE.
STANCHIONS- OPTIONAL
LIFE RAFT
LADDER
VENT
WHIP ANTENNA POSITION
AFT VENT
CHOCK
TOW BITT
CLEAT
CLEAT
CLEAT
SCALE IN INCHES
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

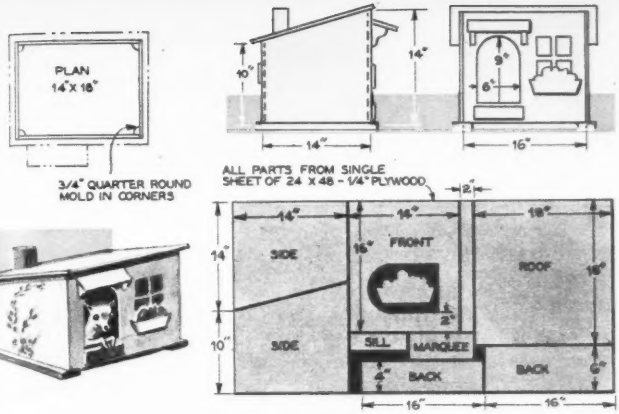


offset so that a bit of left rudder is carried in the neutral position. This can be found by experiment only.

The hull is constructed upside down over a jig board in the same manner as real boats. Mark off centerline and frame stations on the board. Blocks of scrap 1x3 can be nailed along each frame station line to help brace the frames up vertically. Cut the frames from ¼-in. waterproof plywood. The outlines given are for maximum width; allowance for beveling has been made. Tack or clamp frames in place at each frame station. Brace the transom with a block cut to the proper slant. All gluing should be done with hard glue such as Weldwood. Glue keel, stringers and stem in place. Hard balsa or pine can be used. Bow block can be cut to rough shape and glued in place. Next bevel stringers, keel and frame edges to match the curve of the sides and bottom.

Make a heavy paper or cardboard template of one half of the bottom. Transfer the outline to $\frac{1}{16}$-in. waterproof plywood. Cover the bottom with the plywood; small nails and clamps can be used for gluing pressure. Nails should be spaced about one inch apart and they can be left in or taken out later. Cover both halves of the bottom and trim the plywood edges to match the bevel of chine stringers when dry. Make a template of the side and repeat bottom covering procedure for the sides. Shape plywood side edges flush with sheer stringer tops. [*Continued on page* 153]





A Dog's Life

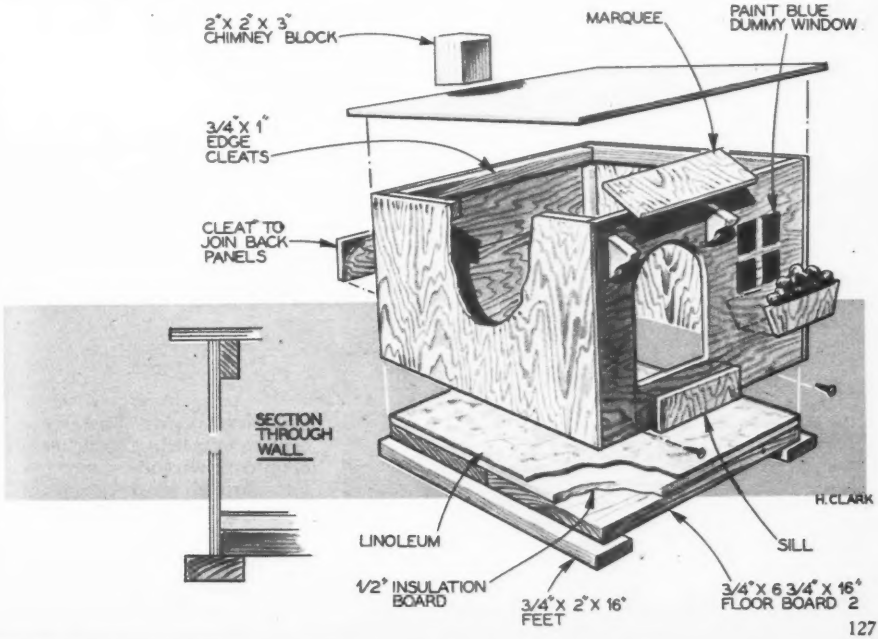
All you need is a piece of 2x4-ft. plywood to beat the housing shortage and keep your pet happy.

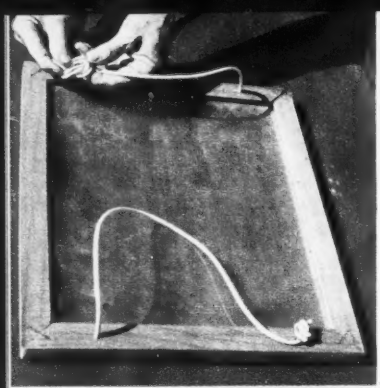
By Hi Sibley

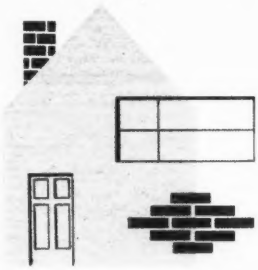
DESIGNED for pet Pekes or other small dogs, this easy-to-build cottage will keep your pup happy and healthy. By following the above plan carefully, you can cut the whole unit out of one piece of ¼-in. 2x4-ft. plywood. If you plan to build it for outside use, ⅜-in. marine grade plywood would be better.

Edge cleats, ¾x1 in., are used to support the inside of the top and ¾-in. round moulding is used for the sides. A 2x2x3-in. block can be attached for a chimney and a little flower box will add to the beauty of the cottage. The windows are painted on and the whole cottage can be either painted or stained to suit your dog's taste.

To keep poochie extra warm, a floor may be added. This is made of two boards with a layer of insulating board and a layer of linoleum which can easily be kept clean. Feet may be added to the unit for additional insulation. •

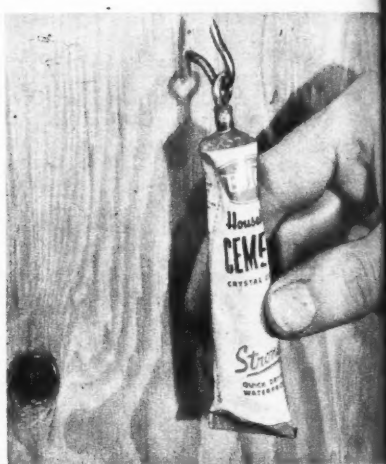






around the house

Cut glare from naked light bulbs by installing this attractive rig. Simply frame a sheet of frosted glass in some 1x2's and run plastic clothesline through a hole in each corner. Four cup hooks screwed into ceiling retain the unit.

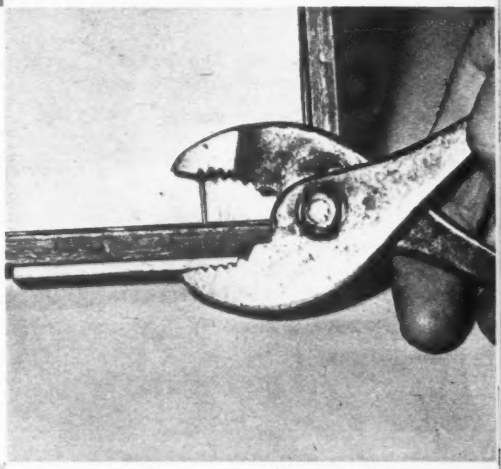


Household cement will always be handy if stored as shown. Insert a small hook in your workshop wall or in the underside of a convenient shelf.

Improve your radio reception by splicing ample length of antenna wire to antenna lead. Pass through screw eyes placed in rear corners of console. Free end is attached to eye at left.

Built-in "coaster" in wooden garden chair solves the drink-parking problem. Bore a 2-in. hole in one arm. This will allow any tapered glass to slip firmly about halfway into the aperture.

Staple guns are excellent tools to use for fastening insulation to ceilings. However, you often find that the tool is on the floor just when it's needed most. If you hang the stapler around your neck with cord, it will always be accessible.



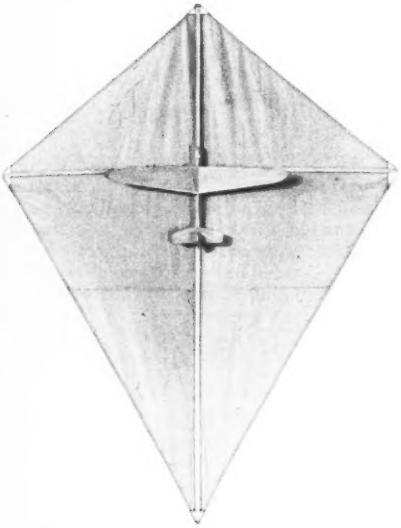
Play safe when framing pictures. There's always the danger of breaking the glass if you hammer the nails. A better method is to use pliers and push the nails in. Put piece of scrap on outside of frame for protection.

Old table fork makes a handy cultivator for your indoor potted plants. Bend the prongs down and use the tool as a hoe, or leave them straight and use as shovel. Works either way.

GO FLY A KITE

Another interesting new kite is shown below. Developed by the G. D. McKays of Montreal, it has three parts—a carrier kite, a glider set under elastic tension on top, and a small kite, not shown. When the rig is flying, the small kite is hooked to the string of the carrier kite and loosed. It climbs the string and trips a trigger on the big kite. This releases the glider, which zooms off in a showy manner.

Francis M. Rogallo, who is shown above operating one of his flexible kites, is an engineer on the staff of the Langley Laboratory of the National Advisory Committee for Aeronautics.



MOST sports are contests between persons or groups of persons. Kite-flying, too, can be that kind of sport, but to me it has always seemed a contest between man and the elements.

When I was a youngster, I fussed around with the conventional two-stick and box kites, examples of which appear in the accompanying drawings. Nearly every boy in America can make one of these kites without worrying about dimensions. If he doesn't feel like going to the bother of constructing one from scratch, he can buy one in knocked-down form for less than a dollar. With such a kite, the object is either to attain great altitude or to achieve a long duration of flight.

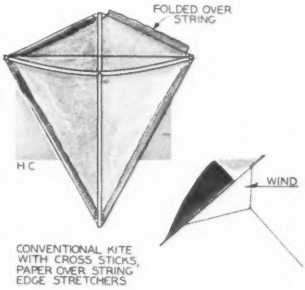
When he grows tired of the ordinary kite, a boy can try making small ones with frameworks of dried bamboo-like grass and coverings of tissue paper. These can be flown on sewing thread in very light winds. Or he can create a stir in the neighborhood by making the largest kites he can and flying

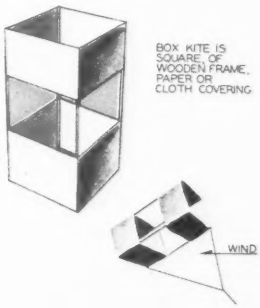
them on small-diameter Manila rope.

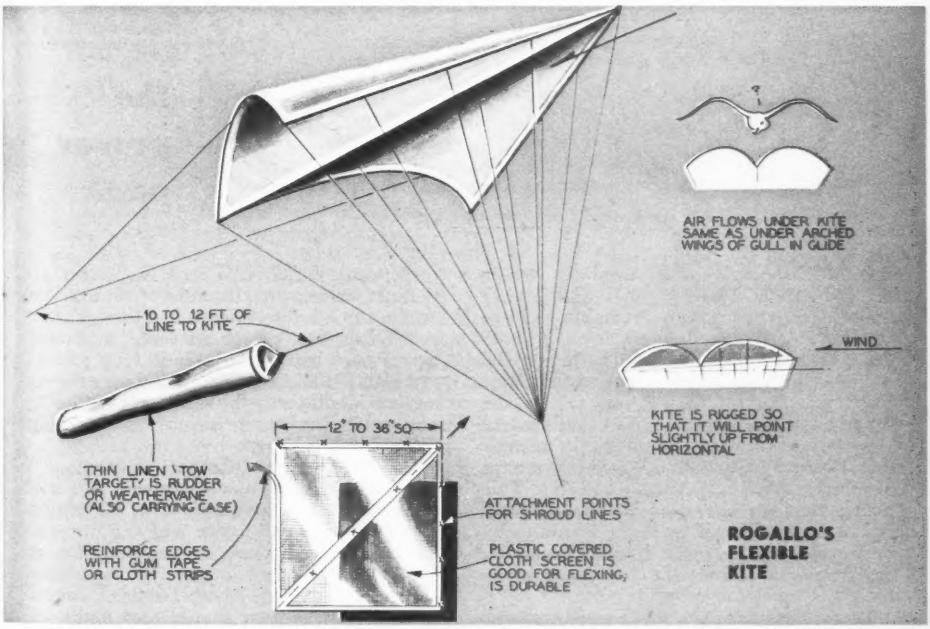
I went through all these phases of kite-flying and then laid aside my kites and studied to become an aeronautical engineer. I now work at the Langley Laboratory of the National Advisory Committee for Aeronautics. It is the function of this laboratory to study problems pertaining to aircraft of all types from parachutes and helicopters to supersonic airplanes.

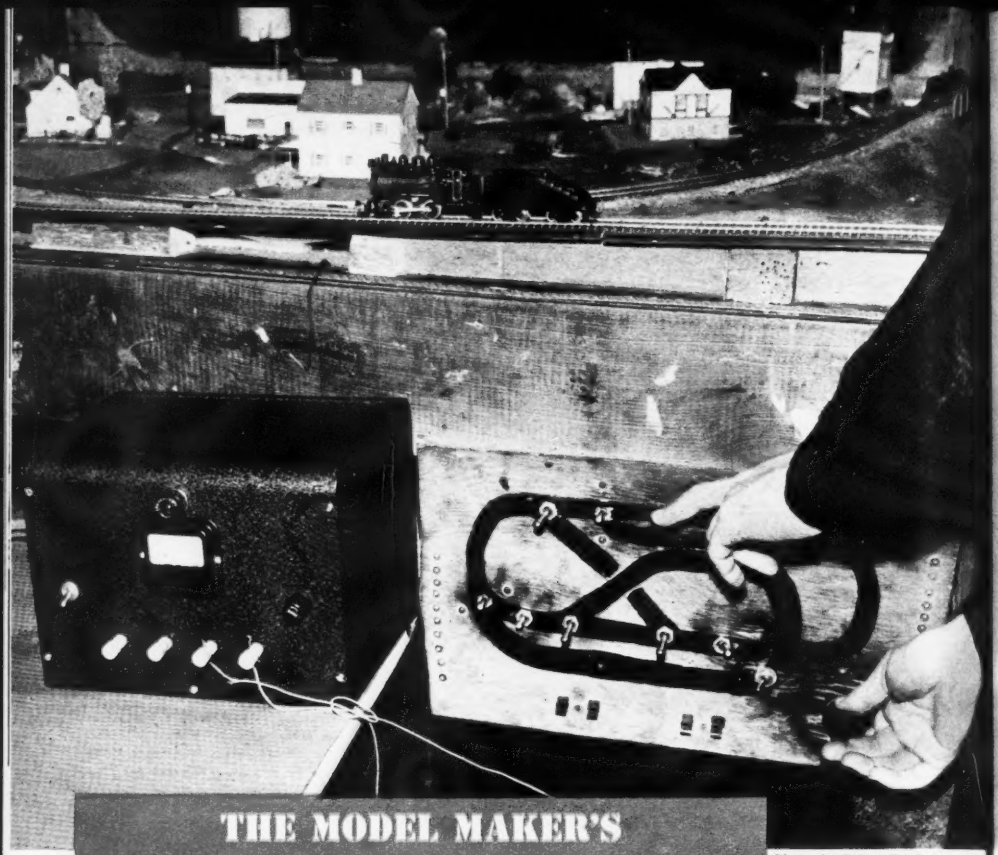
When I again took up kite making after many years of aeronautical research, I was not satisfied with the conventional kites that I had made as a boy. Some improvement must surely be possible, it seemed, in both the aerodynamics and the structure of kites. The conventional kite has a low lift-to-drag ratio, largely because the flow breaks away at the leading edge of the thin, uncambered surface. Its structure is extremely fragile because it must combine a high degree of rigidity with extreme lightness.

We have learned in the study of supersonic airplane wings that it is possible to maintain smooth flow over the upper surface of a thin, sharp-edged airfoil if the surface is given the proper camber, particularly near the leading edge. We have also learned that [*Continued on page* 156]









Photos by Robert Brightman

the power pack

PRACTICALLY all tinplate trains (American Flyer, Lionel and Marx) operate by means of a variable voltage transformer which delivers from 3 to 18 volts of alternating current. The higher the voltage, the faster the train travels. Scale train operators (HO, TT, and O) on the other hand use direct current and control the speed of the trains by means of a rheostat. Realism is further enhanced by means of a block system of current delivery. This means that the operator can energize any particular section of track he wants to by means of a toggle switch. In other words he can keep one locomotive stationary while the other circles around the pike.

To get direct current you'll need a power pack whose function is twofold. First of all it must transform 115 volts of alternating current to a lower voltage and then it must rectify it into direct current. A simple power pack can easily be built from standard electrical accessories in one evening by anyone having only the slightest familiarity with such simple operations as soldering and wiring.

Before beginning construction it is a good idea to know how many amperes you will need for your individual pike. This can be calculated from the type and the number of locos simultaneously in operation. If your gauge is HO allow 1 ampere for each loco; for O gauge make it 3 amperes per locomotive. Of course, you should also make an

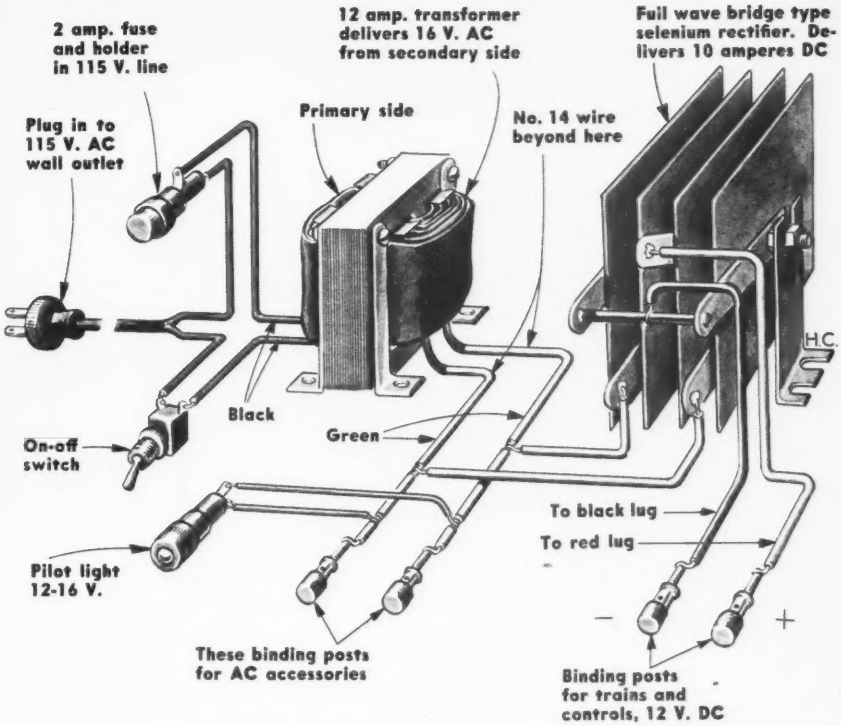
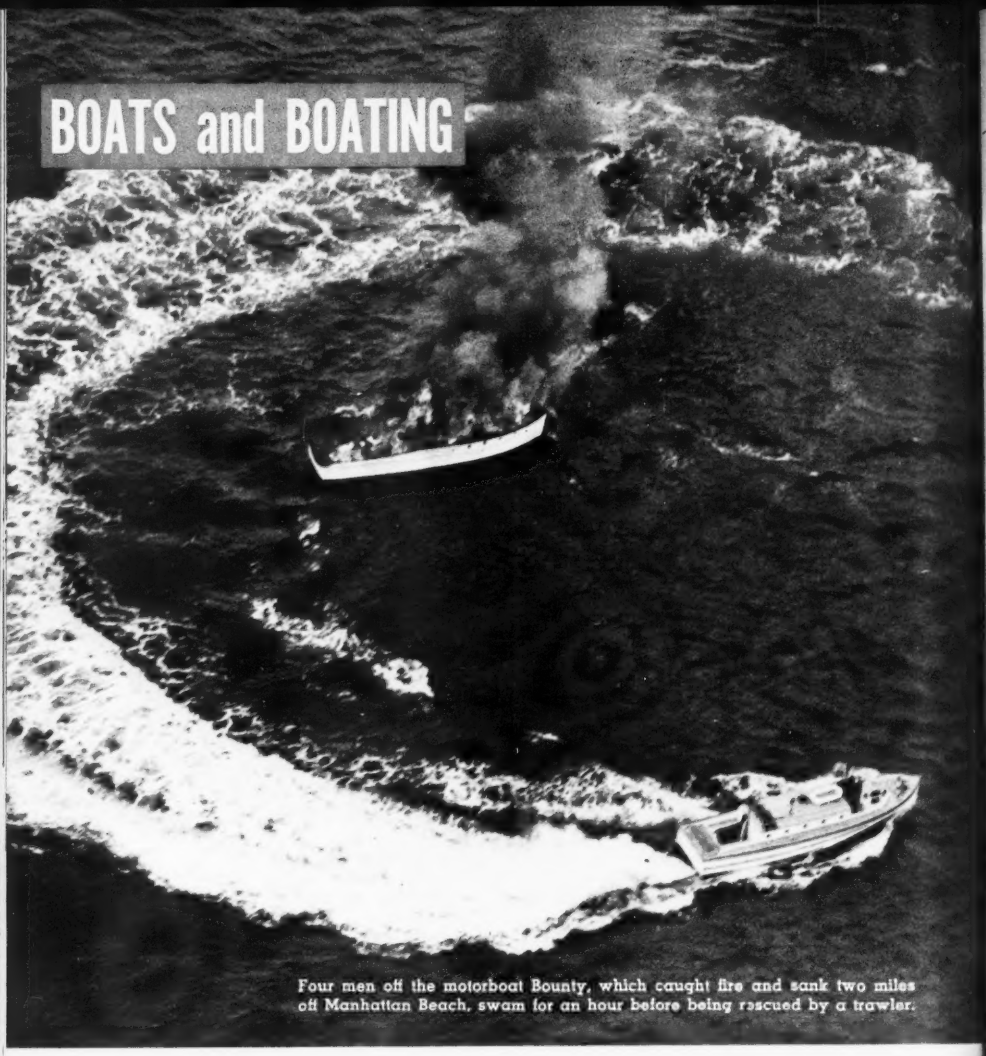


Photo at left shows power pack in use hooked up to switches which control various sections of track. Rheostat controls speed of train. Note how the toggle switches are placed in control panel to correspond to blocks of track they energize. The completed power pack mounted in a standard metal radio meter box is shown below. The ammeter shows amount of current being used.

allowance for any accessories you may want to operate. Generally speaking a 5 ampere power pack should be right. A number of kits are available on the market designed for 5 and 10 ampere output. Your power pack should have one other requirement, a small amount of low voltage alternating current for operating switches and lights. The basic parts of the power pack consist of a transformer, a selenium rectifier, a fuse holder, an on-off switch, a pilot light, line cord and plug, and binding posts. All of these parts can be obtained as a kit from the Opad-Green Co. of New York City. As you can see from the pictorial diagram there is nothing involved as far as wiring is concerned. You can employ any one of several methods for housing the pack. One way is to mount it on a shelf below the pike. Or you place it in a metal cabinet of the type sold by radio supply houses for holding instruments. If you choose the latter [*Continued on page* 160]



Four men off the motorboat Bounty, which caught fire and sank two miles off Manhattan Beach, swam for an hour before being rescued by a trawler.

One-Half Teacup of DISASTER

THE most dangerous thing possible to have loose aboard a boat is a half teacup of gasoline. Those few ounces of gas if stirred up with enough air have the ability to blast a 50-footer all over the harbor. The safeguard against such a happening is to be sure: (a) that gasoline never gets loose inside your boat; (b) that if it does, you can get it out in a hurry; and (c) that no spark can ignite it.

The best opportunity for gasoline to slip into the air aboard your boat is presented when refueling. Marine-insurance companies agree that most fires start right after boats have been refueled. Such disasters are results of faulty techniques and poorly installed fuel systems.

When you dock for gasoline, head upwind so fumes will be blown away from the cabin. Tie the boat securely so it cannot drift away far enough to pull the hose from the filler pipe. Shut down all engines and electrical equipment. Close every window, port, door, and hatch. Put out all cigarettes, cigars, and pipes. Have a fire extinguisher handy in case a blaze starts.

You should know just how much your tank holds and then should leave at least 2 per cent of the tank empty for fuel expansion. If the new fuel has been stored at below-freezing temperatures, leave at least 6 per cent of the tank empty—cold fuel expands quite a bit when it warms up. While fuel is being pumped, keep the metal nozzle of the hose in contact with the filler pipe to prevent any static electricity from sparking. Don't let any gasoline spill or overflow.

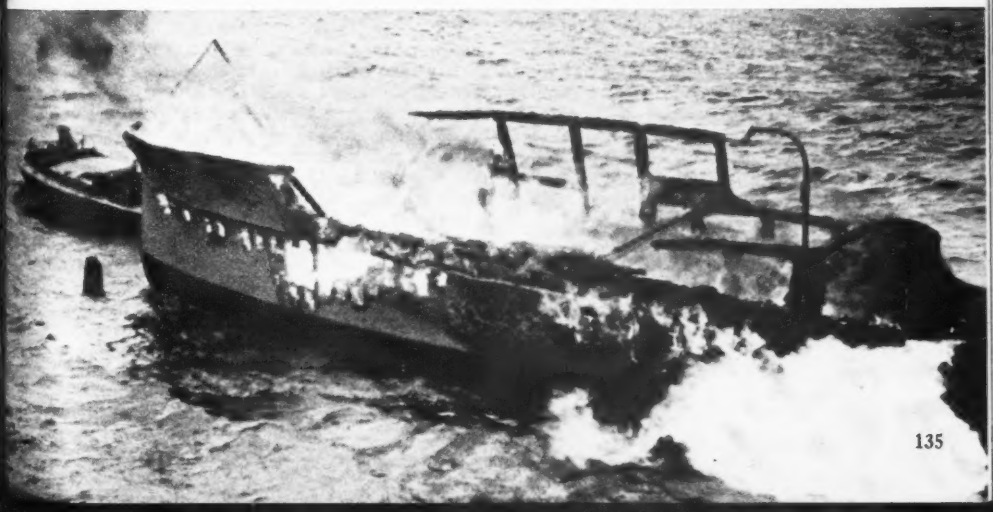
The filler pipe should be at least 1½ in. in diameter and should run as straight as possible from deck to tank to prevent any backing up when the gasoline is pumped in fast. Make sure that the filler-pipe cap is labeled in plain letters—attendants have been known to accidentally pump gas into bilge or cabin ventilators! The pipe should fit tightly into the deck so no drippings or fumes can drift down into the hull. The tank breather pipe should lead to the outside of the hull and should be open at all times. Most of these vents have inverted U bends in them to prevent water and spray from entering in rough weather.

Flexible hose should be used for the line from the tank to the engine so that vibration set up by the power plant cannot be transmitted back to the tank. It's a fine idea to have two shut-off valves in this line—one near the tank and one near the engine. If possible, the former should be installed so it can be operated from the deck. Keep both valves shut off when the engine isn't running. Some boatmen think that draw-off cocks on fuel tanks are handy. I'll get along without one, thanks, for the risk of dripping fuel and leaks about such a valve more than offsets any advantage it might have.

Carburetors should be either well screened or fitted with screened and enclosed drip collectors to catch any fuel that may seep out. Cautious captains will also attach Underwriter-approved flame arrestors just to be on the safe side.

Now let's assume that your tank has been filled—all but the expansion space left at the top—and you are ready to kick over the engine and roar out into the wet blue yonder. But *are* you ready? Let's be sure that you roar *out* and not *up!*

An explosion wrecked the pleasure craft Mary Pat. The seven passengers, including a year-old baby, were rescued after the gasoline-fed flames had severely scorched them. The boat was a complete loss.



Above: Three passengers were killed and seven were injured when the 80-foot Koonyung exploded. Below: All nine persons aboard this 36-footer were saved when it exploded off Stamford, Conn.

Check to see that the filler cap is tight, wipe up any spillage, and ventilate the cabin by opening all doors, hatches, windows, and ports. If there is no strong smell of gasoline below, turn on the ventilating fans and let them run for a few minutes before you start the engine. If there *is* a strong smell of gasoline, you'd better wait awhile before turning on the fans. You wouldn't want a spark from an electric motor to set off a blast. Remember what that miserable little half teacup of gasoline can do to a 50-footer.

All electrical circuits and connections should be kept high above decks, flooring, tanks, bilges, and any other places where gas fumes might collect in dangerous quantities. Keep all connections tight. Use fuse boxes and switches of the enclosed type. Install them 4 ft. or more above the deck on any convenient bulkhead that isn't in the engine compartment. If a fuse should blow, pull all switches so there will be no load on the line when you snap in the new fuse. Otherwise, a spark might be generated. It takes but one tiny spark to set off any dangerous mixture that might be aboard.

Mount the generator and all electric motors well above the fuel lines and any vapor-trapping pockets. Even the generator that's attached directly to the engine should be located well above the crankshaft. If you have an air-cooled gasoline-driven pump or generator, never use it below decks. Keep all storage batteries in tight-fitting racks and in well-ventilated spots. Cover the batteries as a protection from objects dropped from above. Be sure the terminals are tight, clean, and free from corrosion. Check them frequently.

When installing the galley stove, mount it securely and make sure that the insulation is adequate for the amount of heat generated. If the insulation becomes charred and thin, replace it with new material at once. If your stove is the type that uses kerosene or wet-primed alcohol, put a drip pan below it. If the stove uses bottled gas, be sure the tanks are held tightly in their racks and are adequately ventilated.

The final secret of safety from fire is ventilation of the entire hull, particularly the compartments where the fuel tank and engine are located. Ventilation does not mean just plenty of air—it means air in circulation. To insure constant motion of the air in the engine room, all four corners of the compartment should have ventilating ducts that run all the way down to the bilge. Gasoline fumes, being heavier than air, sink as low as possible, so the lowest part of a boat is the most dangerous.

These ducts should be of the type that cannot be closed, even in rough weather. If you are building or altering a boat, remember that the forward ventilator cowls should face aft and the after cowls should face forward. If the size of your purse warrants it, install an electric blower in one of the forward vents to push air through the compartment. The motor on this blower should be outside the duct so it can't ignite any fumes if it sparks. For a boat up to 20 ft. in length, use vent ducts at least 3 in. in diameter. For every additional 5 ft. of boat length, add ½ in. to the vent diameter.

If your boat does not have good ventilation now, get it right away for more safety on the water. Pardon the rather wet pun, but remember . . . it's ventilate than never!

—*C. B. Colby.* •

inertia-operated bilge pump

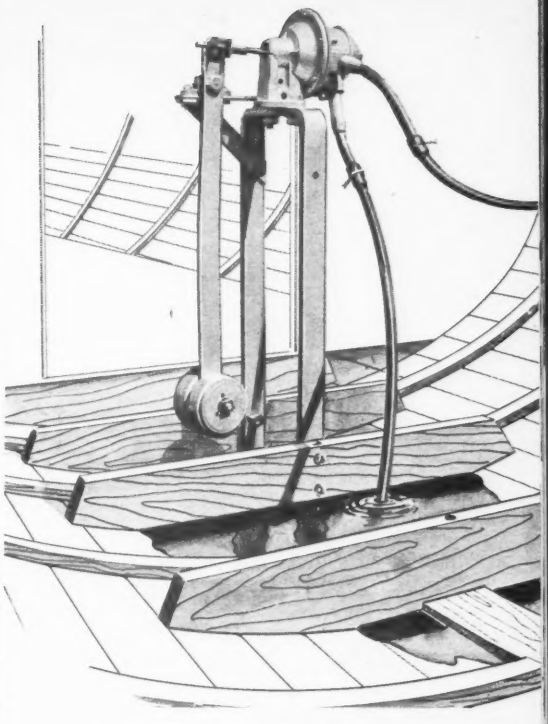
WEEK-END sailors will enjoy peace of mind if they know the water from normal seepage during the week is squirting overboard with every roll of their boats. With an average of six strokes per minute, this pump will move 30 gallons a day.

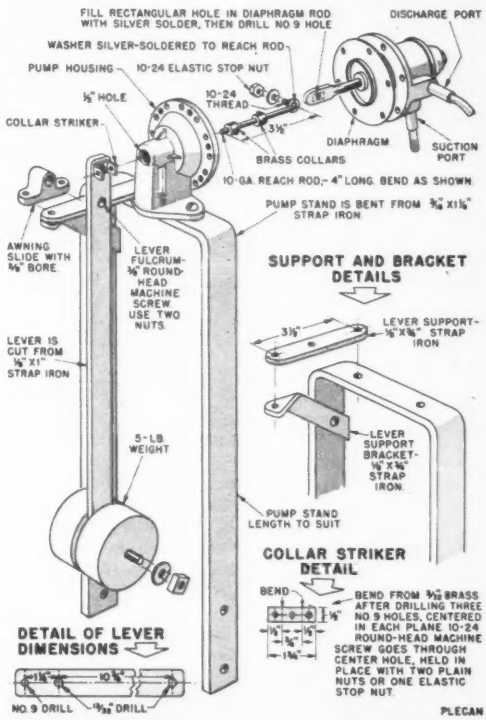
Purchase a secondhand fuel pump without a vacuum-booster chamber. Disassemble and thoroughly clean it and add new valves, valve springs, diaphragm, and gaskets. Omit the diaphragm return spring. Solder up the rectangular hole in the diaphragm rod; then drill a No. 9 hole for the reach rod. Drill a ½-in. hole in the pump housing for insertion of the reach rod. The reach rod and collars are taken from Junior's Erector set. Bend the rod as shown and silver-solder a small washer at the bend. Thread the short end of the rod for a nut. Replace the pump screen with one cut from bronze window screening, which will provide sufficient protection for bilge service. Assemble and check the pump.

The lever is 12¾ in. long; drill it as shown. Make the collar striker and fasten it to the top of the lever so it is free to rotate. The counterweight can be cast from lead or built up from 3-in. plate washers. Make the pump stand to suit and bolt it to two adjacent frames so the lever swings athwartships. Bolt the pump in place and add the lever support, the lever-support bracket, the awning-slide lever bearing, and the lever. Set the reach-rod collars ⅛ in. from the ends of the striker.

Pipe up the pump with $\frac{5}{16}$-in. rubber hose over $\frac{5}{16}$-in. copper tubing fitted to the pump ports. Use bronze screening to form a bonnet over the end of the suction line.

—*R. Lieto* •





You can haul anything from a boat to a refrigerator on this versatile little flat-deck trailer.

By Bob Whittier

dual-purpose TRAILER

HOMEMADE boat trailers using old auto wheels are, we have found from experience, pains in the neck! They are so heavy that crews are needed to handle them and they are far larger than is required for the average outboard motorboats. Why take the wheels and axle from a 3000-lb. car to use under a 300-lb. boat?

The trailer shown here has been used for three seasons and has proved to be a little gem. It features a flat deck that can be used to transport almost any kind of load up to about 500 pounds. To carry a boat, merely add a suitable cradle. To carry a load of camping equipment, just add a rack body.

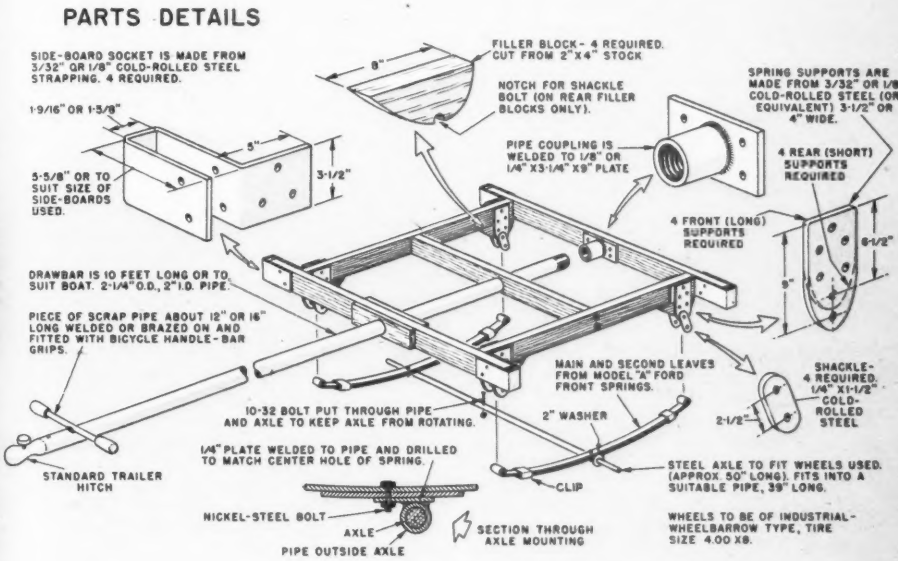
The wheels are of the wheelbarrow type and take 4.00x8 tires. They can be ordered through almost any large hardware store. If you can't purchase them in your locality, a typical manufacturer is Gar-Bro. Wheel Co., Los Angeles 21, Calif. The wheels

come with different types of bearings for different purposes—be sure to specify that yours must be suitable for high-speed use on the open highway.

Begin construction by laying out the simple two-by-four chassis framework. Hard pine is strong enough for this, but oak may be used if you prefer. Do not bore the holes for the drawbar until after the chassis is completed. Lay the five main members on a smooth surface and lightly nail them together; then lay the top boards on the frame and lightly nail them down. Square everything up and then bore through the boards and two-by-fours with a $\frac{5}{16}$-in. bit. Drive $\frac{5}{16}$-in. carriage bolts through the holes and install washers and nuts on the bottom. Cut off the excess threads and lock the bolts by hammering their ends over.

which is in turn bolted to the rear transverse member. The thrust of the towbar is transmitted to the rear member, which in turn transmits it to the side members. An inspection of the drawings will show how the pull is distributed in the frame—it is impossible for the drawbar to be yanked out. The small handle welded at the front end of the drawbar is a great help when launching or hauling a boat and when using the trailer as a hand cart. It is also the means by which the drawbar is installed or removed. With the drawbar removed, the trailer can easily be stored on end in the back of a garage.

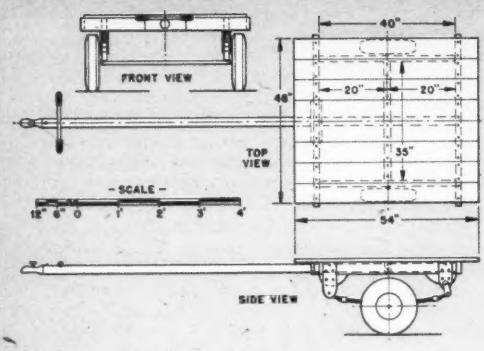
Next, go to a Ford dealer or a spring shop and buy two front main leaves and two front second leaves for a Model A. Have regular spring clips put on. This makes a

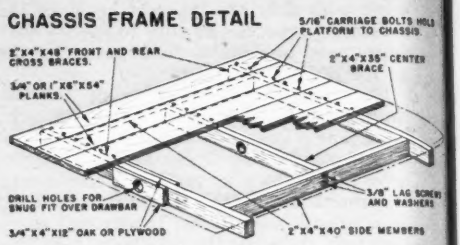


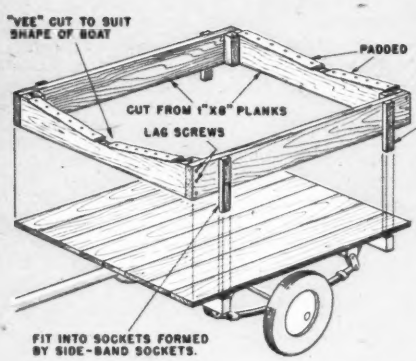
You now have a sturdy platform that is the main part of the trailer. The next step is to glue $\frac{3}{4}$-in. oak or plywood reinforcements to the forward transverse member to strengthen it where the drawbar will pass through; then bore this member and the intermediate cross member to take the pipe, setting your expansion bit so the hole is a rather snug fit.

Note that the drawbar threads into a pipe coupling that is welded to a steel plate,

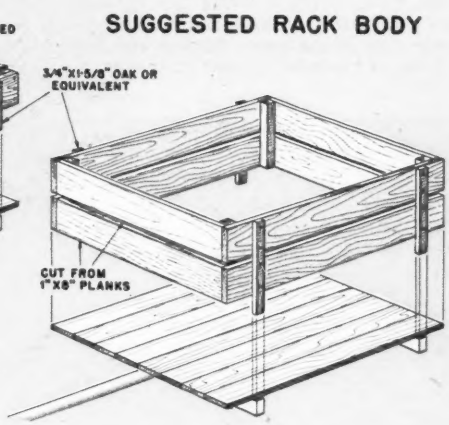
pair of two-leaved springs. Most chaps will exclaim in protest at the use of such seemingly light springs, but the truth is that they are entirely adequate to carry a 500-lb. load. What is more, they give the average 200 to 400-lb. boat a good, soft ride. If you use complete car springs, you'll batter things to bits. This trailer has been towed up to 60 mph with a 15-ft. boat on dirt roads without a trace of weaving or swaying. 'Nuff sed! [*Turn page*]







BOAT CRADLE



The dimensions shown for the spring supports and shackles are approximate. You want the trailer to ride level—most homemade trailers ride with their tails in the air because they are hitched to low, modern cars—so install the trailer hitch on your car and screw the drawbar into the trailer just as it is. Block the trailer up with scraps of wood until the drawbar and trailer floor are just about level—perhaps a couple of inches high at the rear to allow for spring deflection under load. Then make your supports and shackles to fit so that your trailer will ride level behind *your* car.

The drawings show clearly how the corner brackets and spring supports are held on with the same bolts. Perhaps you will want to have a blacksmith cut and bend these items for you. Take the trailer to his shop so he can try them for fit. When done, bolt everything on.

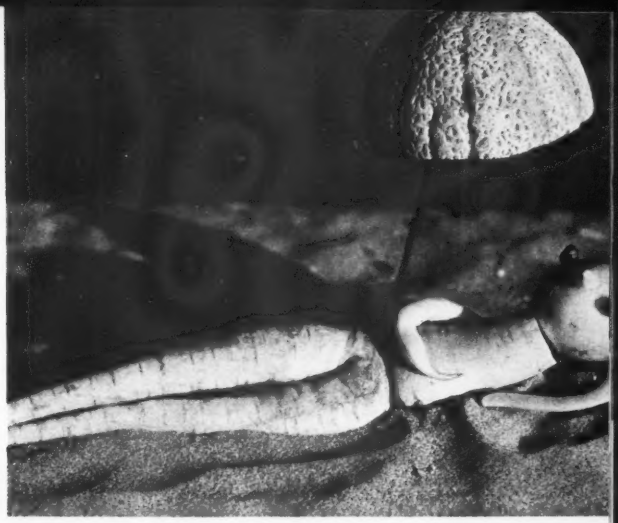
The axle must be selected to suit the wheel bearings. These wheels generally take a rather small axle—say 5/8 to 7/8 in. Use a steel rod, available at any steel-supply house. Chances are it will look rather skinny to you. It did to us, so we got a piece of iron pipe into which our axle would fit snugly. Tabs were welded to the pipe and drilled to match the center-bolt holes in the springs and then 2-in. washers were welded to the ends of the pipe. The pipe is secured to the springs with two *nickel-steel* bolts. Such bolts can be had at any airport—talk to a mechanic and he'll either rustle a pair up for you or tell you where to send for them. They will last forever.

Apply wood preservative to all wooden parts and, when dry, go over the whole trailer with a couple of coats of truck paint.

The boat cradle and rack body can be made to fit your needs. The length of the drawbar can be varied if necessary. Make it long enough so your boat will clear your car. Give the wheel bearings a shot of grease often if you run the trailer into the water when launching a boat. The trailer can be used in salt water. •

MONTHLY

PHOTO CONTEST



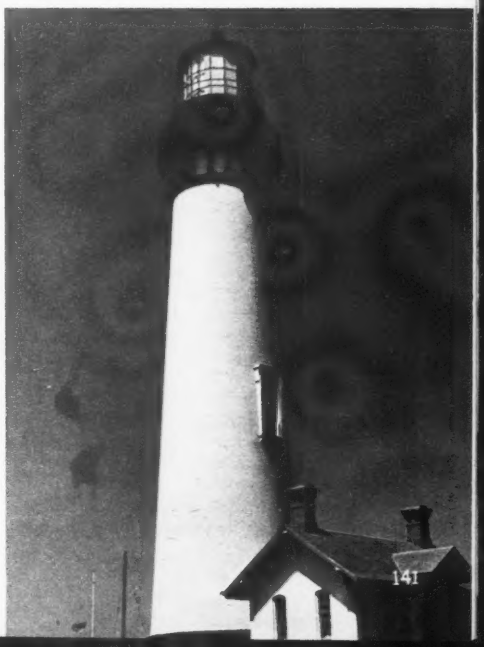
1st Prize.....Beauty On The Beach $10 goes to Ralph Viggers of Santa Barbara, Calif. for his whimsical study of a bathing girl.

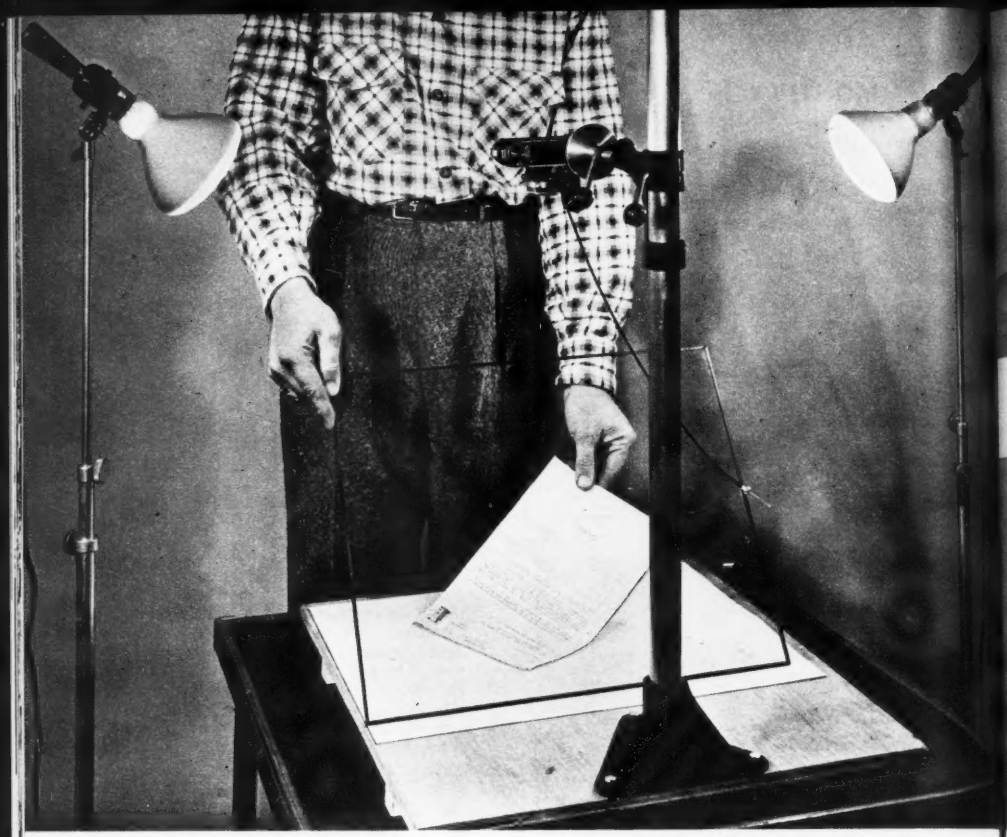
$5.00 Award.....Meditation Taken by Eva Kretschmer of Rochester, N. Y. with a 4x5 Graphic on Super XX film; f-32 at 1/25th.

Please put your name, address and picture-taking data on back of each print. Wrap with cardboard stiffeners and enclose a self-addressed stamped envelope or postage for return of unused photos. Prize-winning pictures are not returned. Judges are MI Editors. Duplicate prizes awarded in case of tie. Please address your entries to: Photo Contest, *Mechanix Illustrated*, 67 W. 44th St., N.Y.C. 36

$5.00 Award.....Sentry Del Colclough of Modest, Calif. took this shot with an Argoflex camera, red filter and Plus X film.

$5.00 Award.....Mom, I'm Hungry A No. 5 flash shot with a Rolleiflex camera on Ansco Supreme film by R. C. Ferguson of San Diego, Calif.





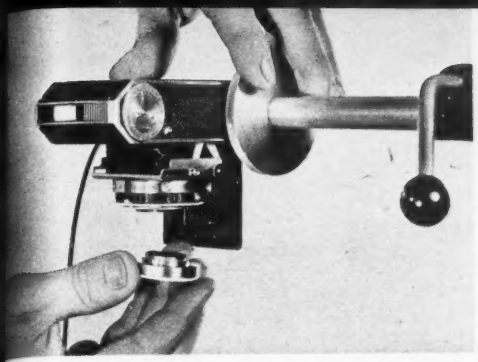
document copying

CALL it "red tape" if you like, but documents and legal papers play an increasingly vital role in your life today. Birth certificates, army or navy discharges, insurance policies, property records and other documents are valuable and should be protected. Your camera provides a means of copying these papers so that you can make expendable work prints for reference use and cache your precious originals away in a bank vault.

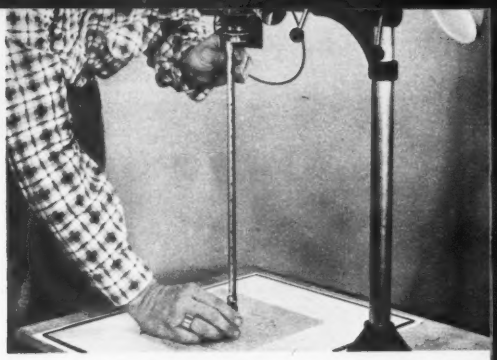
Although press cameras or view cameras, having ground glass focusing screens and long bellows, are best suited for copying, ordinary roll film cameras can be adapted for this work.

First you will need some means of raising and lowering the camera over the copy easel on a rigid support. A regular copy stand, an enlarger stand, or even a drill press can be used. The object is to center the lens over the copy with the film plane parallel to the easel. This is easily done by leveling both the camera and the easel and then dropping a plumb line from the lens. Another method, useful if the material to be copied is of uniform size, is to place a piece of ground glass, with the ground surface towards the lens, in the film plane of the camera before loading it. With the shutter and diaphram wide open you can then compose and focus visually. (Ignore the camera's viewfinder, as it will not be accurate for close work.)

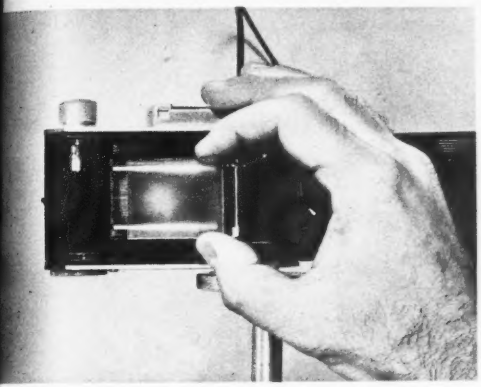
In order to focus at close distances with an ordinary camera purchase a 2-diopter



A copying lens of 2 diopters fitted to an adapter or holder will enable you to fill the entire negative area with the material you are going to copy.



Center the lens exactly over the document and measure the working distance carefully with a tape measure. Follow manufacturer's instructions.



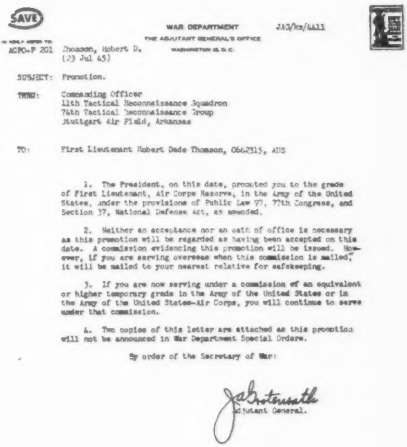
If the back of your camera can be removed or swung aside, check the focus with a piece of ground glass held flat against the film plane.

The special 35mm copying film used for this type of work should be developed in a high contrast developer such as Eastman D-8 or Ansco 90.

positive lens and an adapter ring to fit it to your camera. (The cost is from about $3.50 to $5.00 depending on size.) The 2-diopter unit will handle the majority of your work. In use, measure accurately from the supplementary lens to the copy, in accordance with the table supplied with the lens. Stop the diaphragm down to about f-22 to assure sharp focus.

A sheet of heavy, clear glass, with the edges taped for safety, will hold the papers flat. Material printed on one side only should be backed with white cardboard. Papers printed on both sides should be backed with black cardboard.

To illuminate the easel, use two lamps, one on either side. Adjust them to illuminate the copy [*Continued on page* 162]



SAVE

WAR DEPARTMENT JAG/ks/4411

THE ADJUTANT GENERAL'S OFFICE

WASHINGTON 25, D. C.

IN REPLY REFER TO: AGPO-P 201 Thomson, Robert D. (23 Jul 45)

SUBJECT: Promotion.

THRU: Commanding Officer
11th Tactical Reconnaissance Squadron
74th Tactical Reconnaissance Group
Stuttgart Air Field, Arkansas

TO: First Lieutenant Robert Dade Thomson, 0662315, AUS

1. The President, on this date, promoted you to the grade of First Lieutenant, Air Corps Reserve, in the Army of the United States, under the provisions of Public Law 77, 77th Congress, and Section 37, National Defense Act, as amended.

2. Neither an acceptance nor an oath of office is necessary as this promotion will be regarded as having been accepted on this date. A commission evidencing this promotion will be issued. However, if you are serving overseas when this commission is mailed, it will be mailed to your nearest relative for safekeeping.

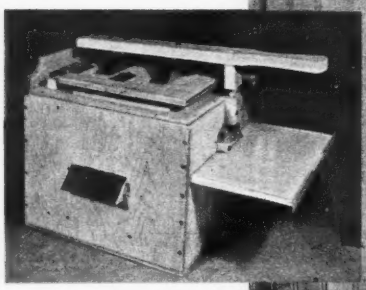
3. If you are now serving under a commission of an equivalent or higher temporary grade in the Army of the United States or in the Army of the United States-Air Corps, you will continue to serve under that commission.

4. Two copies of this letter are attached as this promotion will not be announced in War Department Special Orders.

By order of the Secretary of War:

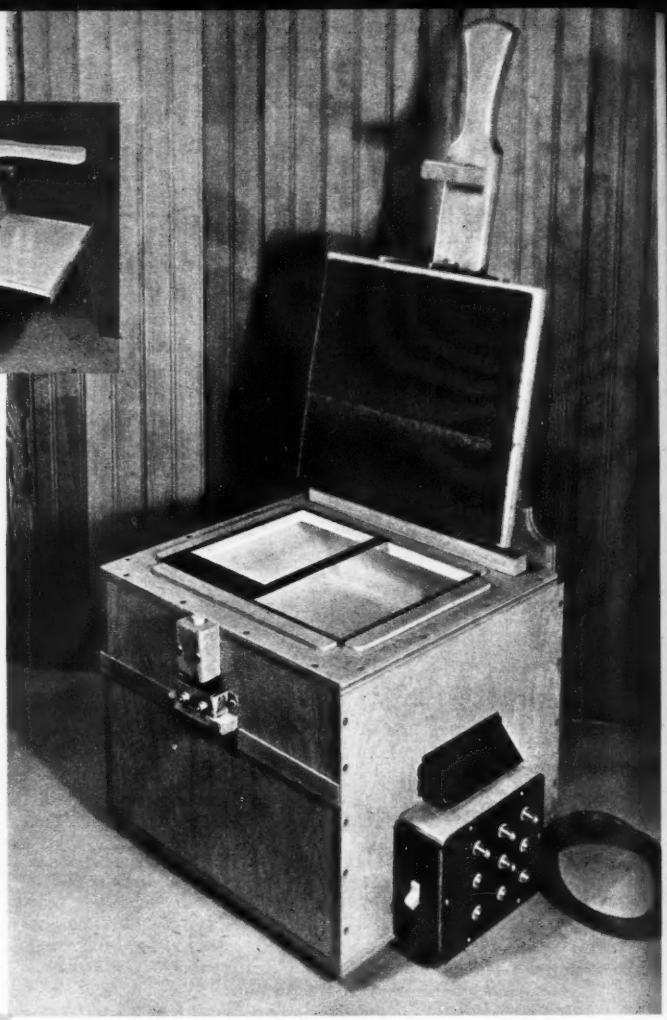
J. A. Grotenrath
Adjutant General.

Reproduction at right is from an actual 35mm frame. Instead of having your love letters take up that entire bureau drawer, copy them on film.



The flashed opal glass used for diffusion is mounted in a removable frame.

contact printer de luxe

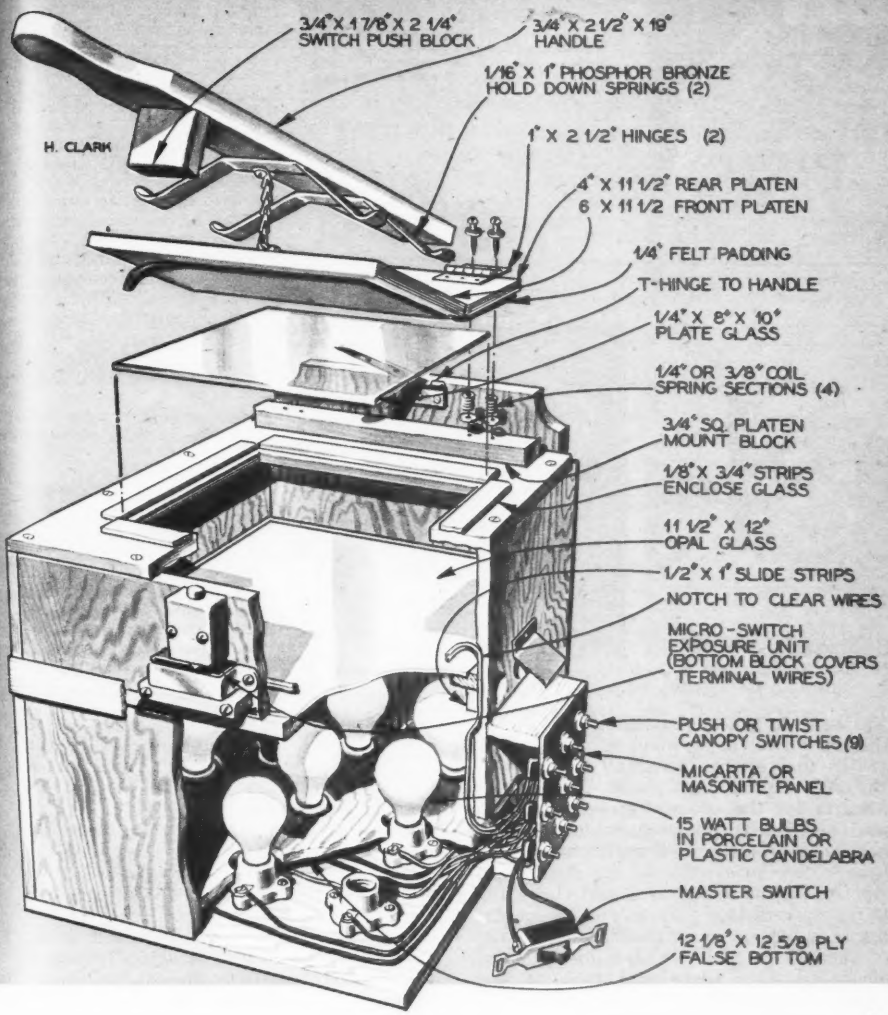


Finished contact printer boasts individual light controls for easy dodging.

COMBINED into this photo printer are all of the features usually found only in the best commercial type boxes together with other features that provide for excellent prints at a rapid rate.

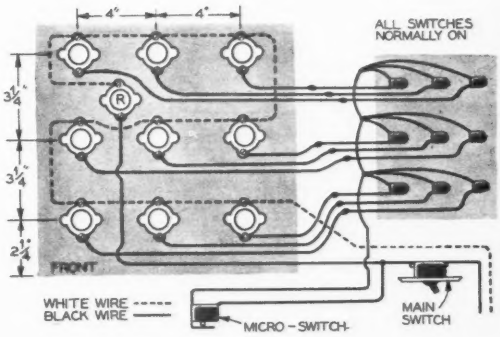
This printer has a light control panel so that if the negative is heavy or light in certain spots, individual lights can be turned off or on at will, eliminating the work of cutting tissue paper for dodging. The platen is free floating which means the printer can take any weight paper, assuring even, positive pressure.

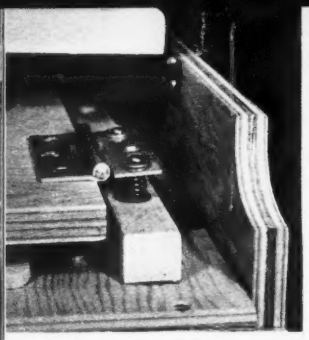
The box is made of ½-in. plywood held together with No. 1¼-in. wood screws and glue. Assemble sides, front and back first. Then fit in false bottom and finally the bottom and then the top. Before

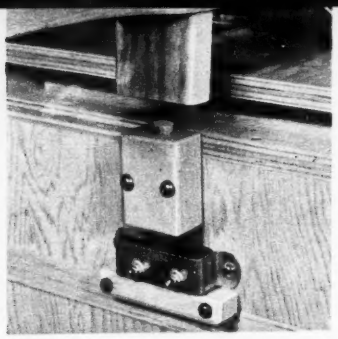


the top is attached permanently, cut the opening for the glass. This must be cut accurately allowing a $\frac{3}{16}$-in. margin all around so that the finished print will have an even border. The opening should be 7⅝x9⅝ in. The glass is held in place by small strips ⅛-in. high by ¾-in. wide. Bore ¾-in. ventilating holes in the sides and back before assembly.

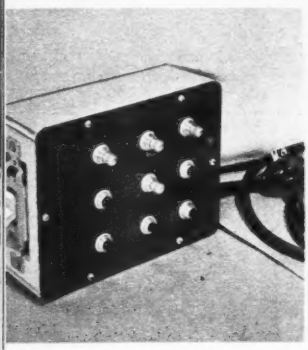
Do not attach the bottom with glue because you may want to check the wiring at some time. Locate the sockets on the bottom, lining them up with the holes

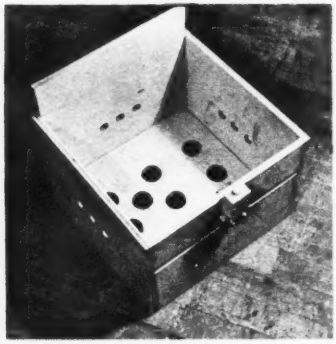






Far left: The free floating platen obtained by spring loading the hinges automatically adjusts itself to different thicknesses of film or paper. Photo to right shows installation of micro switch. Bottom block covers exposed wires. Spring-loaded dowel protects switch from excessive pressure.



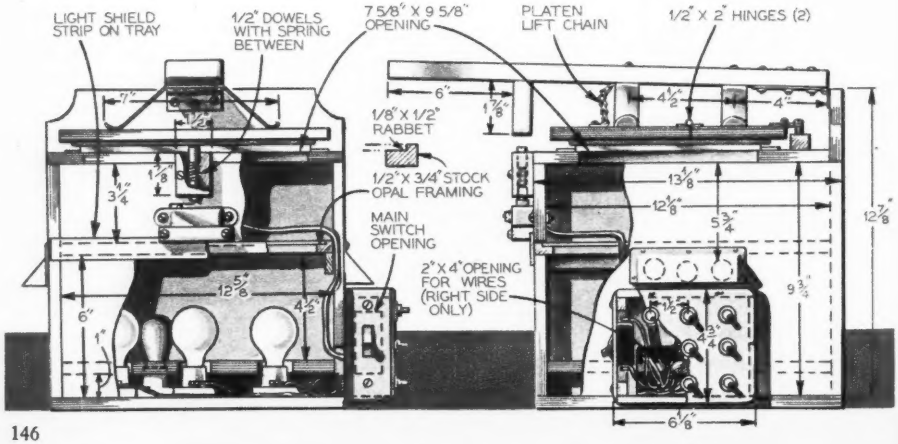


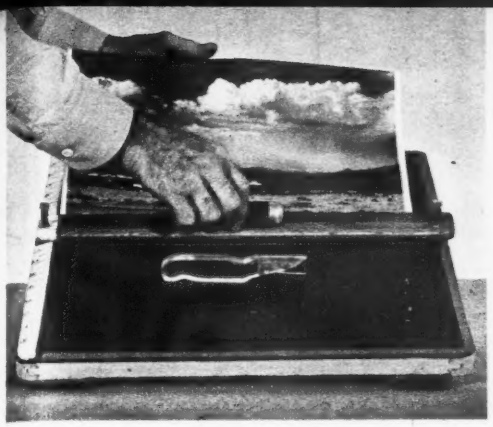
Far left: Toggle switch installation which controls the lamps in printing box. Photo to right shows the holes cut in the false bottom through which the sockets project. Holes at sides provide good ventilation.

you have in the false bottom. Next make the control box of plywood. Fit in the main switch and attach the small switches to the side cover. Use either Bakelite or Micarta for the cover. Proceed with the wiring using No. 14 wire. Solder all connections and wrap well with tape. Cut a hole in the lower edge of the right hand side of the main box to thread the wires to the sockets. Bring the two wires for the micro switch up along the side of the box in back of the slide which holds the opal glass frame in place and then to the switch.

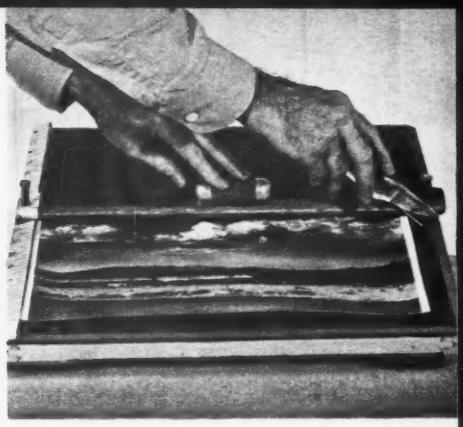
It is well to check your wiring before the unit is finally put together. When everything is working as it should, attach the bottom and then attach the control box with screws from the inside.

The next step is making the platen of plywood. Cut it accurately. Then glue the ¼ in. felt pads to the bottom side, letting it dry overnight. Locate the ¾x¾ in. strip on the top and then install the spring-loaded hinges. Use a ¼ or ⅜ in. coil spring that you can buy in 3 or 4 in. lengths at the hardware store. Cut pieces long enough to have fairly [*Continued on page* 158]





The print is slipped under the cutting board's pressure plate to assure a straight, even cut.



Prints or mattes can be trimmed from either side. The board's design makes matte cutting easy.

general purpose cutting board

PHOTOGRAPHERS, doing their own print trimming and matte cutting, will greatly appreciate this different type of general purpose cutting board. Not only can single and double weight prints be accurately and conveniently cropped to size, but mattes to match can be cut on the same board.

Because of the simplicity of design, only a minimum of tools are necessary. The only special tool not generally found around the home workshop is a 10x24 tap and tap stock to thread two guide pin holes in the cutter bar. The strap iron cutter bar is prepared by drilling the two guide pin holes with a No. 25 drill and tapping them with the 10x24 tap. Screw holes are then drilled with a No. 40 drill and countersunk to receive ¾-in. No. 3 flathead screws flush with the bar. When the cutter bar is attached to the left base board, it should be lapped over the [*Continued on page* 160]

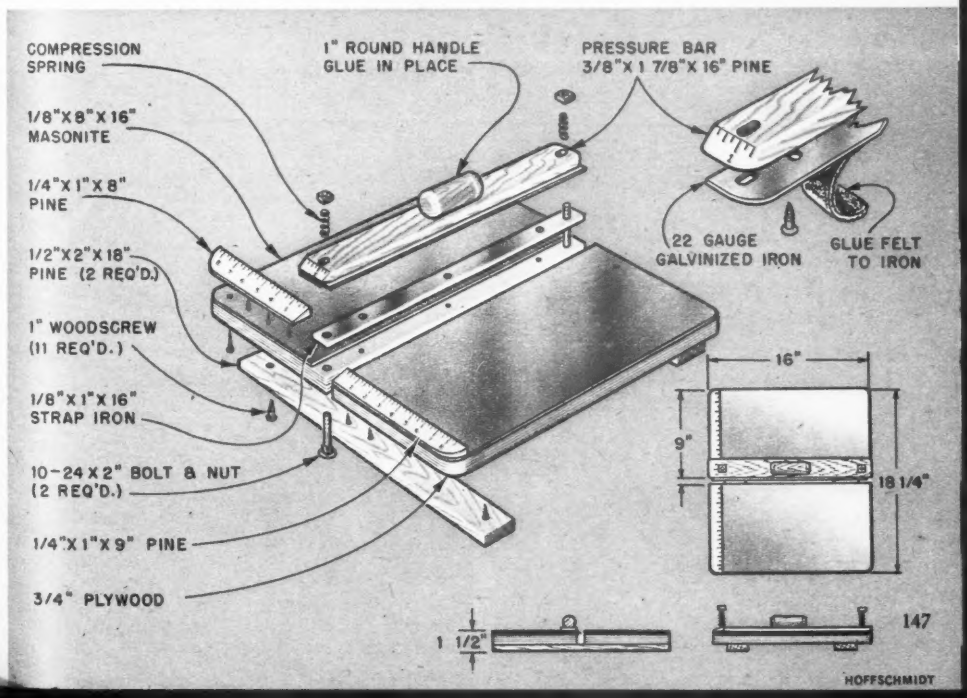
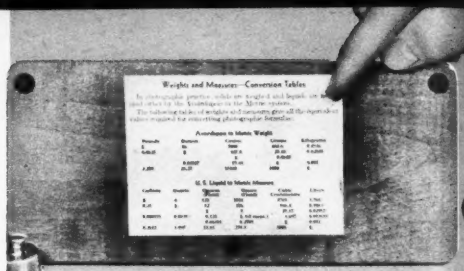
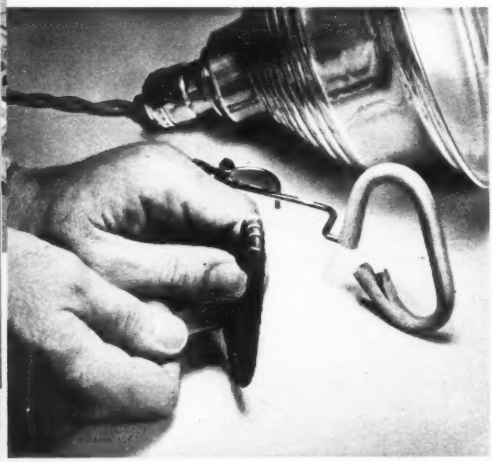


PHOTO SHORTS

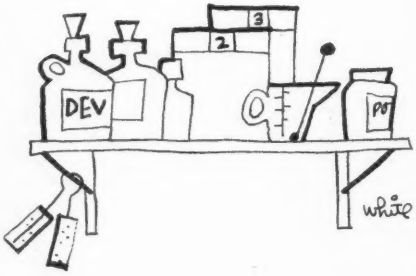


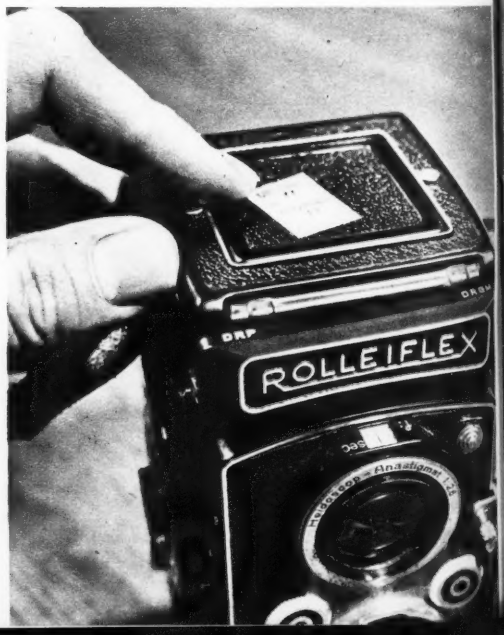
Conversion tables of weights and measures are usually mislaid when needed. Try pasting a copy of such tables to the bottom of your photo scale base, and the desired information will always be at hand.



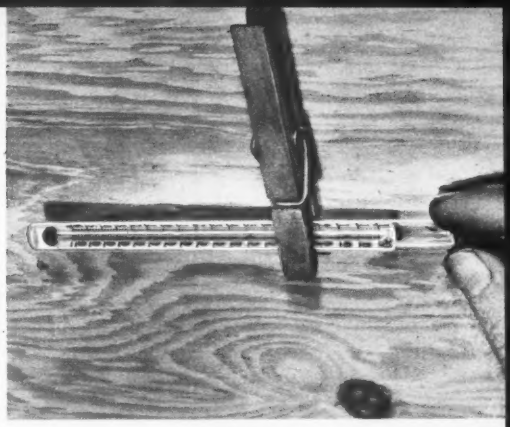
When rubber grips crack on your floodlight clamps, emergency repair may be made by using ordinary friction tape. Open spring clip, remove the worn rubber tubing, and apply two or three layers of the tape.

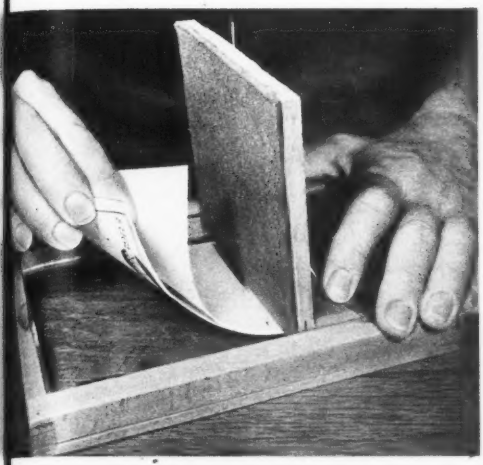
If you use more than one kind of film in your camera, be sure you know what you have on the spool. Moisten the strip of gummed label that seals the paper around an unexposed roll, and affix it to camera.





Thermometer holder may be conveniently fashioned by using a spring-type clothespin. Take pin apart and fasten one leg to darkroom wall. Then reassemble and place your thermometer between both jaws.

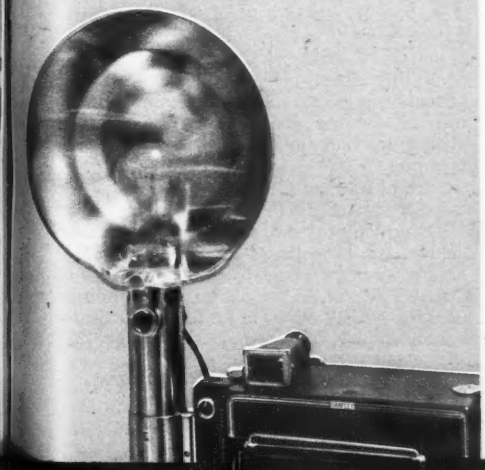




A quick way to get copies of letters, model releases, etc., is to make contact prints, just as though they were negatives. Printed surface should be against glass, emulsion against the back of the document.

Some heavy cameras have a tendency to twist and wobble even when mounted on a perfectly rigid tripod. To overcome this deficiency, cement a piece of corrugated rubber matting to the metal tripod head.

Blue plastic bowl cover slipped over flash reflector is protective device, and also doubles as blue flash fill when used with clear bulb. This method cuts costs and obviates necessity of toting blue bulbs.



The Amateur Telescope Maker's Page

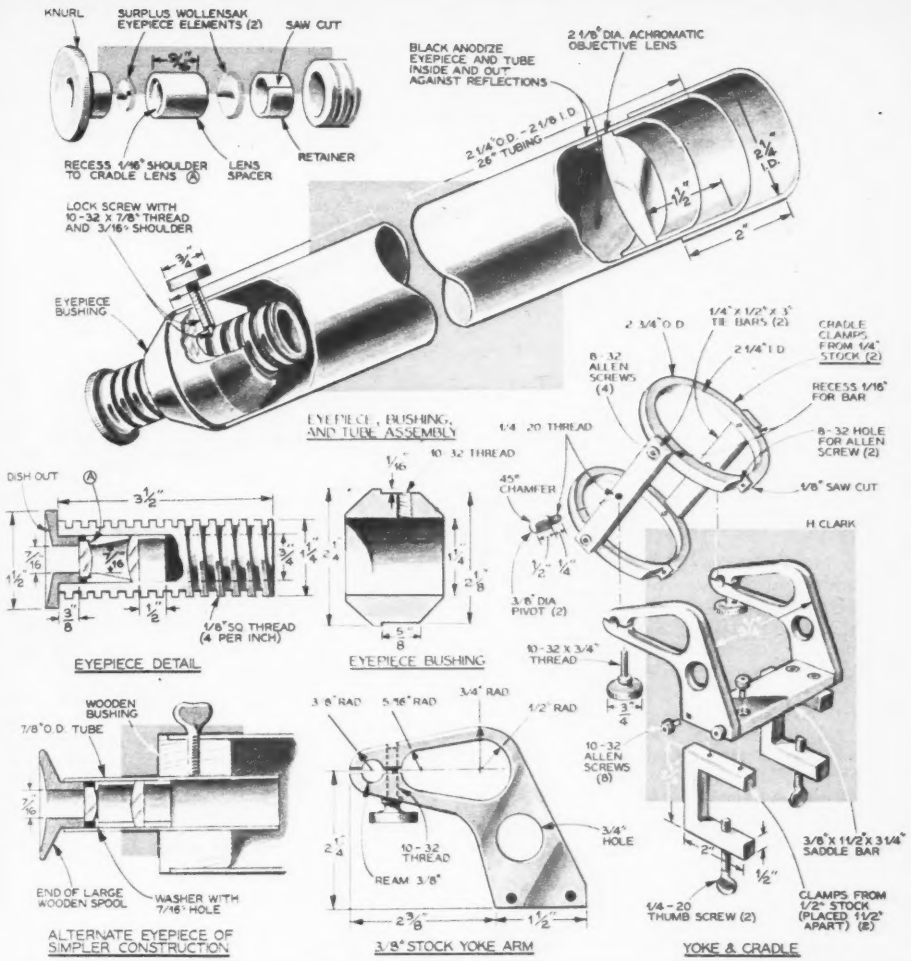
Conducted by Robert Brightman

Photos by Grayson Tewksbury

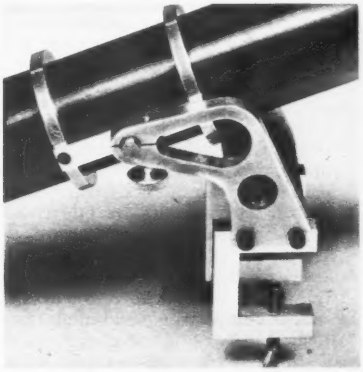
Paul Palanek of Valley Stream, N. Y., and refracting telescope he built using surplus Wollensak eyepiece and Jaegers achromatic objective.

HAVE you ever said to yourself, "Can I really build a good telescope capable of serious astronomical observation?" If you will look at the work of Paul Palanek of Valley Stream, N. Y., the answer is a resounding "yes." Here is a man who up until the time he tackled this project absolutely had no experience whatsoever in optics. Yet he built the superb refracting telescope illustrated on these pages.

The eyepiece and the 2⅛ in. diameter achromatic objective lens of 24½ in. focal length were purchased from A. Jaegers of Ozone Park, N. Y. for $15.00. In combination they yield a power of about 30 times, ample enough to [*Continued on page* 192]



Long eyepiece adapter permits focusing from infinity to 30 ft. Set-screw locks eyepiece in place.



For convenience in mounting, clamp can be turned around so that opening can face front or rear.

[*Continued from page* 120]

baffle to be considered. Then there is the clutch throwout mechanism to be checked, including the bushing which is likely to be the self-lubricated type. Included in the inspection should be examination of the clutch shaft pilot bearing, the driving face of the flywheel, the clutch shaft bearing and the splines of the clutch shaft. An extra flywheel and a gauge plate are among the special pieces of equipment needed to do a good job. Joe really has his hands full and should not even consider the job without detailed instructions for the particular make of clutch on his car.

Smart is the owner who can meet clutch oddities calmly and find a remedy that doesn't involve removal of this hard working unit. Just about everything in the book happens as a result of clutch misbehavior. Among the common varieties of trouble are:

(1) Grabbing, slipping, dragging and chattering. (2) Vibration. (3) Rattles, squeaks and other odd noises. (4) Failure of the clutch to transmit engine power to the gears. (5) Incorrect adjustment and misalignment.

Those which I have grouped under (1) have a common cause in grease or oil or other foreign matter in the clutch. If this oil is fresh it is likely to cause slippage. If it has been "baked" with heat it may result in a glaze, and grabbing or chatter follows. If the oil becomes tacky it will prevent full release. Dragging will follow. Gears will clash.

Oil can work into the clutch from the transmission or past a worn rear main engine bearing or its retainer. The latter is the usual source of an oily clutch. Sometimes oil is forced to leak from the motor because of excessive crankcase pressure due to a clogged vent. If there is a leaky core plug at the rear of the block, inside the flywheel cover, water or anti-freeze will get into the clutch. Evidence of all this is the appearance of oil or coolant on the garage floor just below the clutch housing vent. Oily clutches often can be cleaned up with gasoline, but there will usually be an early return of this trouble.

I might interject here that clutches are highly unpredictable. A clutch may grab one day and not another; and it isn't always due to weather or climatic conditions. Often serious clutch trouble will disappear with continued use of the car. Much also depends on the quality of the clutch facings. In fact, no clutch is any better than its facing.

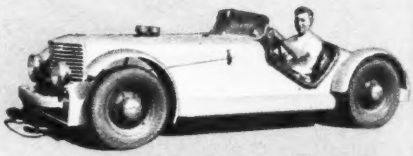
Anything that is not normal with the clutch will cause the various common troubles in group No. 1. Wear on facings will, for instance, cause slippage. So will binding of the clutch pedal or lack of adjustment that causes it to hit the underside of the toeboard.

Vibration I have explained largely as improper balance, but it can also be caused by failure to use a flexible type of plate where the rigid variety was not intended. A bent clutch shaft will play a tune of its own, and so will anything that results in whipping of the propeller shaft, again clearly illustrating the clutch's sensitiveness to other car units.

Noises mentioned in group No. 3 may be the penalty for a variety of clutch conditions, including worn sleeves and throwout bearings, an oil-starved pilot bearing, worn splines, rear end looseness (there is it again!), loose clutch hub, improperly lubricated main drive gear bearing, etc. I wouldn't take clutch noises too seriously unless they become persistent.

But in the first three groups misalignment may also be a factor. One of the leading suppliers of clutch facings considers misalignment between the engine and transmission as one of the most common of clutch troubles. It not only provides a lot of car misbehavior but results in rapid wear on such parts as retractor collars and levers, as well as the splines of the clutch plate on the shaft. In some cases the strain is so great on the driven member it may break off the hub. To check all this it may be necessary to remove the clutch and the gearbox so as to check the flywheel and the housing with a dial gauge. Runout of the flywheel should not exceed .003 in. Keep in mind that misalignment is very rough on the transmission's gears and its bearings. In fact, any clutch trouble is a problem for the car in general. Rear end gears may be damaged by sudden clutch engagement. Overheating and engine strain result from clutch slippage. Many an engine is strained because a rough clutch tempts the driver to cut down on shifting. •

MI SPORTSTER



Why envy the owner of a snazzy sports car? Build one yourself with these complete instructions and plans for less than $500. To get your copy, send $3.00 to MECHANIX ILLUSTRATED Plans Service, Greenwich, Connecticut. Specify Plan No. HJ-19.

PT-810

[*Continued from page* 126]

The bow blocks can now be carved to final shape; fair smoothly into the plywood planking of the boat's hull.

Before any more work is done on the hull, the engine and drive assembly should be installed. Fit the wood engine bearers in place and check their alignment carefully. See that their tops are at the same angle. Make the engine bearer plates from aluminum. Bolt to wood engine bearers and spot engine mounting holes. This should be done with coupling, shaft and shaft tube in place. Try to get a straight line from prop to flywheel. The hole through the bottom should be a bit larger than the shaft tube so that the tube can be shifted to align properly. Space around the shaft tube can be packed with wood slivers and Plastic Wood to make a watertight joint. Glue wood engine bearers and shaft tube in place only after alignment is perfect. The shaft must turn freely; any binding will cause undue wear.

The rudder can be made now and fitted into the stern. Note that the rudder is slotted for the shaft. The shaft is positioned at the center of the rudder stock; solder is then smoothed over so that the shaft is faired very cleanly. Do not just solder the shaft to one side of the rudder or the turbulence created will cause unequal turn radius. The rudder shaft tube is held in vertical position with a triangle of plywood extending forward from the transom. Bend shaft over to form tiller.

Complete all other work inside the hull. Insert screw eyes for receiver mounting and battery hold-downs. Glue ¼x½-in. strips to the bottom between Frames 4 and 5 for battery and battery box positioning. Give the inside of the hull several coats of fuel-proof dope if a glow-plugged engine is to be used. Now add the deck beams. Note that the lower portion of the beams fit under the sheer stringers. The fore and aft pieces (carlings) are then put in place over the top of the beams. Space between sheer stringers and carlings are filled with another piece of same stock so that carling and beam tops are flush with sheer line.

The plywood deck is now cut to shape. Carefully cut out the removable sections and save. Make these cuts with a very sharp knife rather than a coping saw. Check fit of deck on the hull for proper overhang. Coat spaces between beams with fuel-proof dope and glue the deck down. When dry, the deck, sides and bottom can be sanded smooth, filled and painted. Add $\frac{3}{32}$-in. square pine or hard balsa spray strip along chine.

Superstructure comes next. All parts are balsa block or sheet. Scale the parts directly off the plans. The deckhouse and bridge is built up over the plywood panel cut out of the deck so that a snug fit results when this structure is in place. The hold-down is of the type used on Team Racer cowls. The bottom anchor for the hook is a loop of $\frac{1}{16}$-in. wire wrapped around the top fin of the engine. Rear deck hold-downs are phosphor bronze clips mounted to slide under deck Frames 4 and 5.

Since the engine is mounted well down in the hull, it needs plenty of cooling air. Tests of the original boat were run in the wintertime with fairly low air temperatures, and cooling seemed adequate. For summertime operation, however, it will probably be necessary to make the front of the bridge removable for better cooling. The rear of the deckhouse should also have holes enlarged for the same reason. Mast structure can be made up of steel and brass wire, soldered together. The base is brass sheet bolted to the rear deck.

All guns were made with weather covers on, simulated by carved balsa block. Details of the armament are hard to locate. No torpedo tubes are shown, but if installed on the big boat they would probably be mounted on the outer edges of the deck between the deckhouse and the stern. All small deck structures were double cemented, pinned or screwed in place.

The rudder servo mechanism is mounted on a plywood panel with brass clips screwed to Frame 5 serving as hold-downs. A single screw through the plywood into the keel holds the front down. A Spitfire fuel cutoff timer was used for initial test runs and its use is recommended to check turn and straight runs before radio control is used.

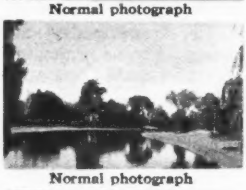
Antenna is three feet in length, of flexible woven aerial wire running from bow cleat to top of scale whip antenna and back to stern tow bitt. Make loop in both ends for ease of attachment, place rubber band at one end, bind wire around antenna. •

Using a battery-powered outboard motor, this handsome model really performs beautifully. Construction is mostly of balsa, with plywood added where extra strength is required. For your copy of these complete, full size plans, remit 50 cents to MECHANIX ILLUSTRATED Plans Service, Fawcett Bldg., Greenwich, Conn. Please specify Plan No. 420

Helpful facts about filters...

Normal photograph

Taken with Yellow (K2) Filter



Normal photograph

Taken with Yellow (G) Filter

Normal photograph

Taken with Green (X1) Filter

Normal photograph

Taken with Red (A) Filter

Why they do so much for your snapshots

Taking snapshots without a filter can be like eating flapjacks without butter—their full flavor and appeal are often not brought out.

Examples of what some of the most popular Kodak Wratten Filters will do are shown on the left. For instance, the K2 Filter is perfect for making clouds *look* like clouds—white and fleecy. And for more dramatic sky emphasis, you have the more powerful dark yellow G Filter. Yellow filters, including the new Kodak Cloud Filter for use with inexpensive cameras, may be used with orthochromatic or panchromatic films.

For emphasizing background foliage and clouds—and at the same time giving a pleasing natural modeling to faces photographed against a blue sky—you can use the green Kodak Wratten Filter X1 (with panchromatic film only). And for the most spectacular, thrilling sky rendition of all, try the red A Filter (panchromatic and infrared films only).

As you use and enjoy filters, you will want to add to your collection. So be sure to see your Kodak dealer for a complete list of Kodak Wratten Filters. Prices start at $1.65 (Kodak Cloud Filter, any size, $1.72).

Warm up your distant color shots with a Kodak Skylight Filter—With this filter you reduce the bluish cast that often appears in distant scenes. Use it to get warmer-tone pictures of mountains, seascapes, sunlit snow scenes . . . pictures made in open shade under a clear blue sky and on overcast days. Requires no change in normal exposure. Prices start at $1.65.

Reproduction from normal color transparency

Reproduction from color transparency using Kodak Pola-Screen

Darken the sky in your color pictures—A Kodak Pola-Screen does the trick—in color or black-and-white. Also offers the only sure way to subdue reflections from glass, wood, water, and other nonmetallic surfaces. The effect your Pola-Screen will have on the picture may be predetermined by looking through the Kodak Pola-Screen Viewer—a miniature screen which fits over the indicator handle of your Pola-Screen. Varying degrees of sky-darkening can be obtained by rotating the screen. Price of Viewer, $6.75; Pola-Screens, from $6.75.

A Kodak Close-Up Attachment gives you pictures like the one above at right

Move in on your subject this easy way—Slip an inexpensive Kodak Close-Up Attachment over your lens and you'll give your camera new picture-taking ability. You can "shoot" at closer range than is normally possible with a fixed-focus camera, and get big, clear images. Use the attachment for head-and-shoulder pictures, close-ups of pets and flowers. The little story above shows you how easy it is—how pleasing the results. There are sizes to fit most Kodak, Brownie, and fixed-focus Cine-Kodak Cameras. Any size, $1.63.

An inexpensive supplementary lens does wonders too

For extreme close-ups—Kodak Portra Lenses 1+, 2+, and 3+ give pronounced close-ups of subjects with both still and movie cameras. When you place one in front of your camera lens you step up its power for short-range photography of people, nature studies, and table-top subjects. Kodak Portra Lenses are graduated in power as their numbers indicate. To secure even stronger effects, the lenses may be used in combination. A 2+ lens and 3+ lens combined give the effect of a 5+ lens. From $2.59.

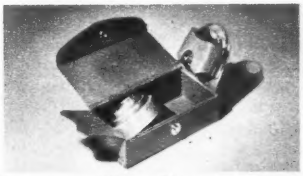
Normal Close-up

With Kodak Portra Lens 1+

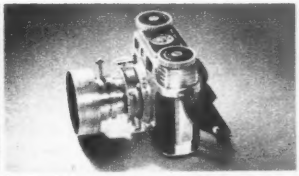
With Kodak Portra Lens 2+

With Kodak Portra Lens 3+

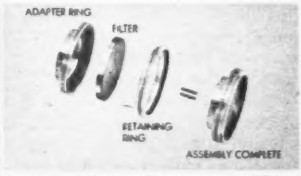
With Kodak Portra Lenses 2+ and 3+



Protect your filters this easy way—Kodak Combination Filter Cases are handsome leather cases that protect lens attachments and provide a convenient way to carry them. One compartment holds a Kodak Adapter Ring, Filter, Lens Hood; the second, three filters. Series V, $4.25; Series VI, $4.95.



Shade the eye of your camera—A Kodak Lens Hood helps to guard against light-streaked photographs by making it easier to keep sunlight from striking your lens directly. It also serves to reduce sky "flare" when pictures are side-lighted by the sun or by photo lamps. From $1.65.



A single Adapter Ring accepts filters and other lens attachments—The two-element Kodak Adapter Ring is the basic unit of Kodak Combination Lens Attachments. Its nonrusting chrome plating matches perfectly the quality finish of your camera. Available in all series sizes. Prices start at $1.29.

Your Kodak dealer is fitted by training and experience to give you valuable help in your hobby of photography. He'll be happy to "talk shop" any time.

Prices are subject to change without notice

EASTMAN KODAK COMPANY, ROCHESTER 4, N. Y.

Kodak
TRADE-MARK

Go Fly A Kite

[*Continued from page* 131]

a light structure can be strong and practically unbreakable if it is, like a parachute, flexible. Compare if you will the weight and ruggedness of a parachute with that of a conventional glider capable of supporting the same weight in the air.

If we could combine the shape of the supersonic airplane with the unbreakable structure of the parachute, we would have a fine kite. But for such a kite to fly, it must possess stability of both shape and position. If we could provide these, the rest would be easy.

We started by making small paper kites and dropping them as gliders. Then we attached threads to them at various points and towed them about the living room. Whenever we found a promising configuration, we would build a larger model of cloth and take it to an open field for a trial. If it didn't fly, home we went to make modifications and then back for another trial. Our efforts were not in vain, for after many attempts we succeeded in making thoroughly satisfactory models.

A simple one has but four shroud lines, two on each side, and the tail is attached either at a single point on the centerline or at the juncture of a pair of lines attached to the trailing edge about midway between the centerline and the tips. A 12x12-in. sheet of paper or plastic with one of the diagonals for the centerline is very satisfactory.

Starting with this simple design, one can add area and shroud lines almost without limit. In addition to the shroud lines attached to the leading edges, we have also attached them along the centerline diagonal, thus forming the surface into a double lobe or bucket shape as shown in the accompanying drawings. At an early stage in the development, we designed a miniature tow target to serve as both a tail in the air and a carrying case on the ground.

One of these days, we're going to make one of our kites large enough to lift a man. We'll supply him with some controls and, to test the rig in safety, we'll tow it from a boat so a crash will not injure the pilot. A further development would allow the kite to be flown as a glider. Imagine the thrill of carrying such a glider in your knapsack to the top of a mountain and then unfurling it and gliding down into the valley.

But the most intriguing possibility is the use of this wing as the lifting component of an auto-airplane. When the airplane alighted, the wing would be folded and put in the baggage compartment. The auto would then drive away unencumbered.

—*Francis M. Rogallo* •

Portable Sanders

[*Continued from page* 104]

pad permits rubbing or polishing furniture and woodwork.

Our final group of motor-driven sanders is known by such names as reciprocal, orbital, or oscillating. The abrasive surface is rapidly moved back and forth, in an oval pattern, or in a combination of both of these movements (see sketch). A clamping device is used to hold the paper or cloth tightly over the head that is operated either through a direct or a belt drive from the motor. It may then be used for sanding, polishing, or rubbing on metal, wood, plastic, or even tough composition materials.

These machines make walls smooth and joints invisible. Repainted fenders and doors of automobiles are feather-edged to perfection. Boat decks and bulkheads are maintained with a minimum of effort.

They can also be used to clean glued joints and to smooth knots and checks. They will rapidly rub down undercoats or fillers before the final finish is applied.

The orbital and oscillating types are noted for their use with, across, or against the grain. They can also smooth butt joints where the grain meets at right angles.

The reciprocating type produces a satin-like finish. It is just about perfect for lapping and finishing.

It might be well to know something about the abrasives that are to be used on these power sanders. Flint is the least expensive and the most common. It is brittle, breaks down easily, and is therefore most suitable for use on softer materials.

Garnet is more durable than flint. The stones tend to break while in use and in doing so leave new jagged surfaces. These prolong its utility.

Emery has a slower cutting action than either flint or garnet because the grains of equal size are not as sharp. It is generally used as a polisher and is used most often on metals.

Silicon carbide is man-made. Sand and coke are fused at extremely high temperatures and the hard clinkers formed are crushed into small grains. This abrasive is very brittle and is used for cutting very hard metals or wood.

Aluminum oxide is made from bauxite and small proportions of iron filings and coke. It is not as hard as silicon carbide but is much tougher.

There are several things to remember when selecting an abrasive. Soft work that might clog the paper calls for a grain that is widely spaced. Finish sanding should be done with progressively finer abrasives, but more than one grit specification should never be skipped for best results. •

just what fishermen ordered!

[AND MAN, HOW THEY'VE ORDERED IT]

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7.5 O.B.C. certified brake H.P. at 4000 R.P.M. Price F.O.B. Factory, subject to change without notice

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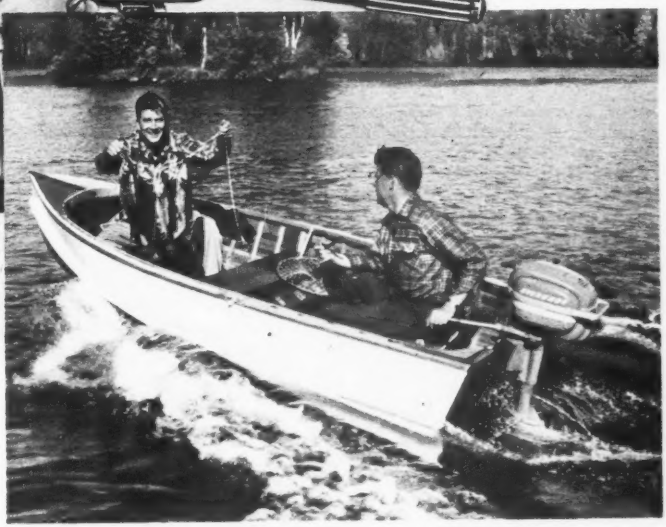

IT'S FLEETWIN . . . by Evinrude! It zoomed into the favor of knowledgeable fishermen the day it hit the water!

Its popularity rides up and up, for there's no motor like it. See how *much* of so many good things it offers you . . .

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But . . . packed into those few pounds you'll find a noble bonus of 50% *more power*. Power that whisks you to your fishing spots miles, miles faster. The smoothest, sweetest, sharpest power you've ever handled!

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SEE YOUR EVINRUDE DEALER—let him give you a show-down demonstration of *all* that Fleetwin offers against the field! Look for his name under "Outboard Motors" in the yellow pages of your phone book. CATALOG FREE! Write today for catalog of the complete Evinrude line.

EVINRUDE MOTORS

4810 N. 27th St., Milwaukee 16, Wis.

IN CANADA: Manufactured by Evinrude Motors, Peterborough, Ontario

EVINRUDE

Contact Printer De Luxe

[*Continued from page* 146]

good compression below the hinge. You need use only two of the three screw holes to screw the hinges in place. Put washers below the springs where they touch the wood strip.

Make the handle next and line it up with the normally open micro switch on the front of the box. A micro switch has but little movement for making the contact and therefore you must provide additional movement in the dowel which pushes the switch. This is accomplished by the hardwood block just above the switch. It has a 3/8 in. hole from top to bottom housing two short pieces of dowel with a length of coil spring in between. The bottom dowel rests on the button of the switch. As the handle is brought down the dowel operates the switch but any additional movement is taken up by the spring so that the switch is not damaged. The top of the block should be even with the top of the box so as not to interfere with the printing. Before the vertical block on the handle is permanently located, it is well to make the hold down springs and fit them in place. They are made of phosphor bronze $\frac{1}{16}$x1 in. Bend the short ends first and then the larger radii for the tops. Bolt them to the handle. Some fine adjustment may have to be made to get both springs to come down evenly but this is simple to do. When finished you can then cut the vertical block on the handle to proper length to operate the switch.

Put a small screw eye in the bottom of the handle and one on the platen and use a brass chain to open the printer. Here again, some adjustment should be made to get just the operation you want of the hinged platen. The frame holding the opal glass has a groove to accommodate the glass. A strip is nailed on front edge to kill any light that may escape.

If negatives of all one size are going to be printed, then a mask can be drawn directly on the glass. Make a different glass for each size of print. The advantage? No fuss or bother with paper masks and sharper edges. Small triangular blocks along the top and left hand side can be glued in place as guides.

In this particular printer 15-watt lamps are used which finish a print in about seven seconds. The ruby or safe light is a 10-watt bulb. It is covered by a small frozen orange juice can from which the top and bottom were removed. One end is covered with two layers of red cellophane paper which yields a bright safe light. The can is merely set over the bulb. The inside of the box is painted flat white. Ventilating holes and ventilators are painted with dull black. Outside is stained light gray and given two coats of spar varnish. •

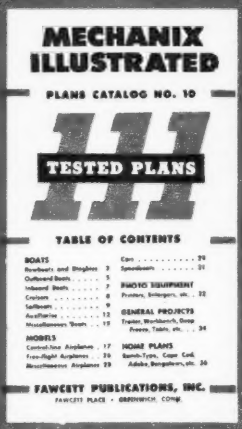
Your Foundation

[*Continued from page* 115]

greatest saving in excavation and in the cost of masonry materials is afforded by the use of this type of construction. However, it requires the addition of girders to support the floor above. Piers may be either poured concrete or built of block with a poured concrete footing below. In order to exclude cold winds, snow and vermin from under the house, a barrier should be built between perimeter piers. This may be done by using sheets of cement asbestos board projecting into the ground and backfilling against the outside.

Any of the four methods described herein would be satisfactory, depending on the type of house and the budget you are working with. Bear in mind that the basement is inexpensive space when compared to the same space built above ground. The added cost of the basement therefore consists of material and labor for about eight additional block courses and the added bulldozer excavation. We may also consider a combination of any of these types to give us a partial basement with a crawl space and/or slab on grade. The choice depends upon the house and the site upon which it will be built. •

YOURS—FREE!



This issue of the MI Plans Catalog contains descriptions of 111 tested plans for boats, models, photo equipment, general projects, and homes. For your free copy, send your name and address and a 3-cent stamp to cover postage and handling to MI Plans Service, Fawcett Building, Greenwich, Connecticut.

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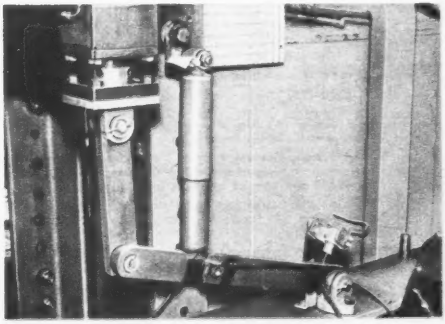

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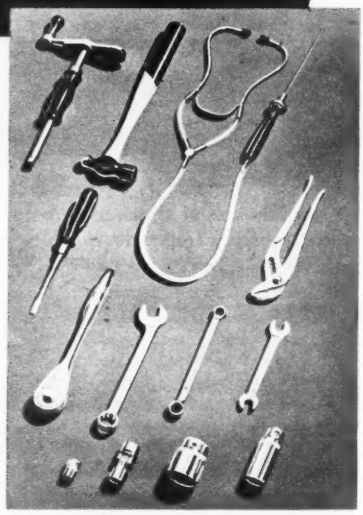

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VAN-CHROME TOOLS

THE BINGHAM HERBRAND CORPORATION

Fremont 16, Ohio

Cutting Board

[*Continued from page* 147]

base by 1/16 in. to assure knife clearance.

Masonite, ¼-in. thick, is cut, drilled and countersunk for screws. The lefthand Masonite piece will be one inch narrower as it abuts the cutter bar as noted in sketch.

Bevel one edge of the two scale strips and attach to the lower edge of the cutting board with glue and brads. Make certain that both are at exact right angles to the cutting edge.

Prepare the upper metal pressure plate of No. 22 galvanized iron by clamping the pressure bar to it, in exact alignment with the front cutting edge. Mark and drill the two guide pin holes with a No. 12 drill.

The upper spring pressure plate is completed by attaching the metal plate to the under side of the lattice wood strip, drilling and elongating the guide holes as before. A strip of felt or canvas is cemented to the bottom of the metal plate covering the screw heads but clearing the guide pin holes, leaving at least ⅛ in. clearance from the cutting edge of the pressure plate.

Guide pins for the pressure plate consist of two stove bolts 3/16 x 1½ in. and are screwed into the cutter bar through the pressure plate holes. A lightweight spring approximately one inch in length will provide ample tension.

With the cutting board assembled and tested for alignment and freedom of movement of the spring pressure plate, nothing remains but to glue a small hand knob atop the pressure plate, apply shellac or varnish followed by enamel and calibrate the scale in inches with India ink. The 16 x 18-in. cutting board cost less than $2.00 but can be made larger if required at a very slight additional cost.—*E. P. Smith* •

Model Roundhouse

[*Continued from page* 133]

it is a good idea to include an ammeter as part of your pack. An ammeter not only shows the amount of current being drawn but will instantly show any cause of trouble on the line. *A high reading means trouble, stop and investigate.*

Remember, this pack only delivers uncontrolled power. You still need a rheostat to control the speed of the train and switches to energize various sections of track. This circuitry will be dealt with in a future article.

In wiring the power pack all connections should be thoroughly clean and mechanically secure before applying the solder. Use a resin core solder, never an acid-type when making any electrical connections. •

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DU PONT CAR WASH

Floats away grime . . . saves you time

JUST SPONGE IT ON

THEN RINSE IT OFF

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You'll never know how fast and easy it is to wash a car until you've used remarkable new **Du Pont Car Wash.** Just a tablespoonful in a pail of water produces a bucketful of fluffy foam. Then this ideal solution goes to work . . . makes the most stubborn dirt, grease and oil disappear in a wink. Simply rinse it away, let it drain, and your car will dry—with no streaks or spots! Next time, let Du Pont Car Wash make the job a cinch for you..

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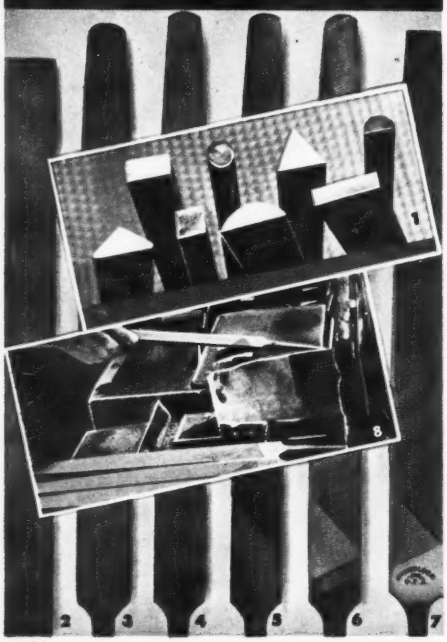
DU PONT № 7 PRODUCTS

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

How a quality file is born



NICHOLSON file quality begins with steels (1) made to carefully determined specifications. . . . File blanks (2) are machine-forged to uniform shape (3). . . . For teeth cutting, blanks are annealed by precisely controlled heating and cooling (4). . . . Blanks are then straightened, ground to remove scale, precision-smoothed to assure teeth of even height and sharpness (5). . . . Teeth are cut by Nicholson-designed machines renowned for their accuracy (6). . . . A scientific process gives the teeth exactly the right uniform hardness—after which files are cleaned, further sharpened, tang-softened to prevent breakage, and oiled to prevent rust (7).

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A FILE FOR EVERY PURPOSE

Document Copying

[*Continued from page* 143]

evenly from a 45° angle (as shown) and you won't be bothered with reflections. Any diffused lamps in matching reflectors will do. Those illustrated have built-in reflectors and are very efficient.

Regardless of whether you use a meter or not, it is best to run a trial of various exposures from which the best exposure for your own equipment can be chosen visually. As a suggested starting point for those who do not have meters, place two No. 2 photofloods in reflectors at about 30 in. from the copy, load with film, and expose a test film for 1, ½, ⅕, 1/10, and 1/25 second at f-22.

Original material can be broadly classified into two groups: (1) *continuous tone* material with many delicate gradations of tone, such as photographs, paintings, or reproductions of them in magazines; and (2) *line copy*, such as printing, letters, typewriting, line drawing, and graphs and charts, which are primarily of only two contrasting tones.

Continuous tone material is best copied with regular orthochromatic or panchromatic films of long scale—these are the standard films sold for everyday use. Line copy originals are best handled with "process" films of extreme contrast. Owners of 35mm cameras or cameras using sheet films can take advantage of the properties of a great variety of special films. But, while owners of roll-film cameras do not have a wide choice, they can nevertheless make excellent copies of all materials with regular films.

Negative processing should be in accordance with the manufacturer's recommendations for the particular film you use. The following films are recommended for copying "line" work:

Roll Films & Film Packs
- **Ansco Supreme**
- **Kodak Verichrome**
- **Kodak Plus-X**

35mm Films
- **Ansco Minipan**
- **DuPont Microcopy**
- **Kodak Micro-File**

Sheet Films
- **Ansco Process**
- **DuPont Process Pan**
- **Eastman Contrast Process Ortho**
- **Eastman Contrast Process Pan**

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1269 Greene Ave., Montreal, Canada

Book Notes

AUDEL'S NEW AUTOMOBILE GUIDE; Theo. Audel & Co.; 49 West 23rd Street, New York City; 1607 pages; $4.00

A MEATY comprehensive guide on the automobile and what makes it tick. The 59 chapters cover about every possible ailment that could befall a motor car and how to cure it. Adequate pictures and good line drawings point up the text. A 13-page index, in addition to the chapter headings, make it rather simple to look up particular parts and service specifications.

LAFAYETTE RADIO'S MASTER CATALOG; published by Lafayette Radio Wire Television, Inc., 100 Sixth Avenue, New York; $6.95

THIS tome is to the radio ham and experimenter what the Sears Roebuck catalog is to the farmer—and city dweller too. What Lafayette has done is to combine every single catalog extant on radio equipment supplies and bound them all in one giant volume. A fascinating book for reference and to pore through.

TIME-SAVER STANDARDS, Second Edition; F. W. Dodge, New York City; 884 pages; $12.50

THE enlarged edition of this volume contains 232 additional pages of vital information on architectural design, engineering data, materials technology, and building practice. Designed for use by architects, engineers, specification writers and other building technicians, it is a series of authoritative treatises embodying all the technical aspects of construction. Whether it be the size of a beam, the proper height of a classroom or the inner workings of a lock you are seeking, you will find the information quickly in this book.

This edition also contains pertinent material from the popular Architectural Engineering section of the Architectural Record. These articles cover such subjects as prestressed concrete, roof trusses, theater design and equipment, and so on.

Because of its proved-by-experience solutions to hundred of structural problems, this book cuts research time and furnishes many shortcuts. Anyone planning to do any building at all—whether it's a birdbath or a bowling alley—would be wise to consult this valuable reference work.

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QUALITY ARMS FAMOUS THE WORLD OVER

Tropicals Are Topical

[*Continued from page* 63]

the male's watchful waiting, the fry hatch out. With young 'uns swimming around, papa must be taken from the tank, too—once the job is done he develops an appetite for his own progeny.

Male Bettas, distinguished by their veil-like fins and brilliant coloration, are the fightingest small fish in captivity. Put two of them in the same tank and they will engage in mortal combat. In Thailand, where they originated, they are specially bred for their fighting qualities and their owners pit them against one another, betting on the outcome.

The most unique protection for eggs and small fry is provided by the Egyptian Mouthbreeder. After the eggs are fertilized, the female scoops them up out of the sand and holds them in her mouth during the two weeks required for them to hatch. She lets the young fish swim about the tank on their own in time, but if there is any sign of danger—such as the approaching hand of the aquarium owner or unfriendly fish—she opens her mouth and the little ones dart back inside.

The African Mouthbreeder follows the same technique, but just to be different it is the male of this species instead of the female who holds the young ones in his mouth.

"That's what makes fish-keeping such an absorbing hobby," says a doctor who, like many in his profession, is a confirmed collector. "Each species has its own peculiarity, its own personality. It may be true that people are all alike, but you can't say the same for your aquarium pets."

Out of the hundreds of varieties of tropicals, there are scores of believe-it-or-nots to illustrate the medico's point. The Archer Fish of Thailand, for example. If he sees a fly buzzing about overhead, he darts to the surface and spits out a stream of water which hits the insect and fells it for his dinner.

Then there's the Leaf Fish—a wafer-shaped character, brown with gold spots, who seems to drift instead of swim through the water. And the Climbing Perch, whose acrobatics on aquarium plants always attract attention. And the Anableps, whose eyes have a bifocal effect—the upper halves are used to see above the surface, the lower halves to see underwater.

You don't need a barometer if there's a Weatherfish in your aquarium; he dashes

[*Continued on page* 169]

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never needs refinishing!

Put up Gold Seal Congowall—and your work's done for good! No refinishing, no repairing, no repainting . . . ever!

And there's nothing to it. Because, tough, sturdy and durable as it is . . . Congowall is *really* flexible and easy to handle. *A cinch to install!* Just paste it up, that's all. Congowall locks itself to your wall . . . *and stays there!* It's up *successfully* in 3,000,000 homes!

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Patented duplex backing identifies *genuine* Gold Seal Congowall.

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Tune in "Suspense!"...CBS Radio Mondays...CBS Television Tuesdays

World's Speed Record

[*Continued from page 59*]

SPECIFICATIONS

MODEL TESTED:

British Jaguar Mark VII five-passenger sedan

ENGINE:

6 cylinder, double overhead cams; bore 3.2677 inches, stroke 4.1732 inches; brake horsepower 160 @ 5200 rpm (with high-lift cams, dual exhaust, approximately 176 bhp @ 5500 rpm); compression ratio 8 to 1

DIMENSIONS:

Wheelbase 120 inches; overall length 196½ inches; tread 56 inches front, 57½ rear; width 73 inches; height 63 inches; weight 3,850 pounds; standard tire size 6.70x16; gas tank (dual) 22 gals

PERFORMANCE:		(with high-lift cams, dual exhaust)
0 to 30 mph,	3.9 seconds	3.1 seconds
0 to 50 mph,	9.1 seconds	8.2 seconds
0 to 60 mph,	12.8 seconds	10.1 seconds
0 to 70 mph,	14.7 seconds	13.5 seconds

One mile from standing start, 47.55 seconds
Top speed, 102.56 mph (on Daytona Beach, official); 106.5 (on hard road); 112 (on hard road, with high-lift cams, dual exhaust)

SPEEDOMETER ERROR:

At 60 mph on speedometer, actual speed 60 mph
At 120 mph on speedometer, actual speed 106 mph

and stiff. The Jaguar is no stop-and-go car by any standards and is at its worst in creeping traffic, when it requires enough gear changing to tax the patience of Job.

After I tested the XK 120 (April 1950 MI) Editor Bill Parker got a very stinging letter from the Jaguar factory in England because I had complained that despite its many virtues the car was put together like a Chinese laundryman's version of a Western sandwich. I won't repeat that crack about the Mark VII. This one is assembled like a cowboy version of Chinese chop suey. To be more specific:

In the first 3,000 miles, the starting carburetor switch went haywire. The speedometer froze; I broke three speedometer cables. The car lost all anti-freeze several times because the head bolts weren't tight and the seat crank broke when it sheared its silly aluminum rivets. The tachometer ran dry and sounded like a cricket with hiccoughs until it was greased. The fan belt stretched to a point where it no longer turned the generator or water pump. Loose fitting gas fill caps caused bad fumes in the cabin. The grease retainers on the front wheels leaked.

The turn indicator went screwy and the

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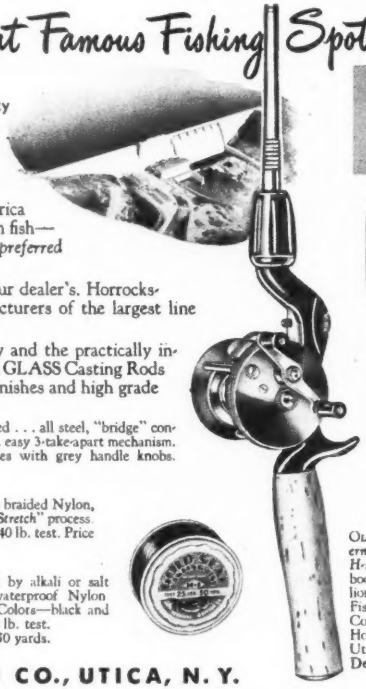

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HIBRIDGE—precision balanced . . . all steel, "bridge" construction . . . spiral gears . . . easy 3-take-apart mechanism. Maroon anodized side plates with grey handle knobs. Price $8.00.

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windshield developed water trickles right down the center column, although the sliding roof—a great feature—remained tight as a drum even through torrential rain. The gaskets on the foot vents came off and, as if this weren't enough, the rubber foot pads on the brake and clutch pedals wouldn't stay on. All these things happened, as I say, in the first 3,000 miles and didn't cost me a cent for new parts. And after these growing pains, the car has given me less trouble to maintain than a sun dial.

All in all, this is a quality car from one end to the other. Dollar for dollar I think the Mark VII is the best automotive buy in the world today. As soon as I finish writing this, I'm heading right back to Palm Beach where my dual exhaust system is waiting to be installed. With that, plus a dash of George Forman's tune-up genius, I'll spit in the eye of any sedan ever built.—*Tom McCahill* •

Tropicals Are Topical

[*Continued from page* 166]

about like mad when a storm is brewing. This finned forecaster, incidentally, belongs to the Catfish Scavenger group. The Scavengers act as housemaids in a tank, cleaning debris off the bottom, slicking up the plants and even wiping algae off the glass sides like window washers. Fresh-water snails, kept in many aquariums, perform much the same function.

Give them a tank with enough room and the West African Butterfly Fish and related varieties will skim or fly above the water's surface by means of their wing-like fins. Other species will make spectacular leaps and, if the aquarium isn't kept covered, they may be found lying dead on the living room rug.

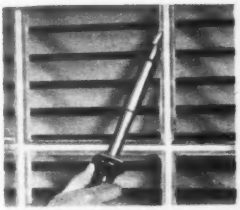
The Kissing Gouramis are recommended for newlyweds. They're so fond of smooching that when papa isn't kissing mamma, the chances are he's kissing his own reflection on the wall of the tank!

Tropicals are supplied to the market today by professional breeders and net-casting adventurers who explore fresh-water rivers and lakes in warm climes in almost every part of the globe. Among the countries which provide the best hunting grounds for the miniature fish are Brazil, India, Ceylon, Mexico.

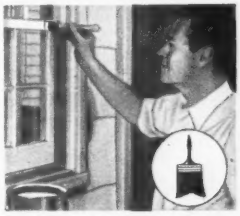
Fred Cochu of Ardsley, N. Y., might be called the Frank Buck of the industry. He holds an exclusive license from the Brazilian government to buy rare specimens from native collectors and to go on collecting safaris of his own far up the Amazon.

Yes, keeping home aquariums filled with pets has become a big business these days because America's hobbyists are seeing to it that tropicals are really topical. •

Pointers for home painters **Windows:**

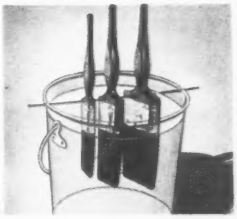


For a lasting job, remove *all* old or cracked putty. Hold tip of an electric soldering iron against putty until it is softened. Scrape out with putty knife.



Don't let your brush "fishtail" (see insert) by painting window frame with oversized brush. Use small nylon-bristled brush—one designed for the job.

Use a protecting strip of cardboard or sheet metal when painting near glass. Leave window slightly opened during drying, so it won't stick shut later.



Clean brushes with thinner after daily use. Suspend brush in thinner overnight. Bristle tips should not touch bottom of can. Work out thinner before repainting.

JOB AFTER JOB you'll get best results with a well-tipped nylon paint brush. Durable Du Pont nylon bristles paint smoother . . . are clean and sanitary . . . never get brittle . . . don't break off even under the roughest treatment. And nylon bristles last from 3 to 5 times longer than ordinary bristles. Leading manufacturers make nylon paint brushes in all types and sizes. Look for the name NYLON on the handle. Be sure to pick the size brush designed for the job . . . and demand Du Pont nylon bristles.

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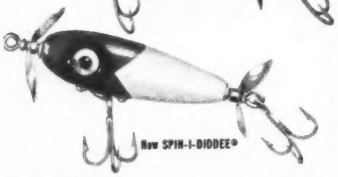

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New Worlds To Conquer

[*Continued from page* 66]

to geographers who variously placed it within an area of several hundred miles. Disease and lack of food forced several members of the expedition to return to base; plagues of mosquitoes and black flies hampered progress; death from beasts and jungle men lay in every step.

But Dr. Cruxent conquered the Venezuelan green hell and filled in another blank on the maps of the world.

The Amazon basin in South America is by far the greatest of all the unexplored tropical frontiers—undeveloped, wild, turbulent and almost wholly unknown. The Amazon River, 3,900 miles long, runs from the Pacific to the Atlantic Oceans and the area it drains is a vast 2,700,000-square-mile empire, almost as large as continental United States. Yet this huge area is still virtually untapped.

What is awaiting the pioneer in the Amazon basin? Perils on the one hand, unsurpassed bounty on the other.

The perils: Hostile natives. Only recently, the Maquiritare Indians slaughtered eight Venezuelans who ventured into the wilderness to trade with them. Reprisal was impossible. The Indians, flitting silently and unseen through the dense forests, have learned the art of camouflage so well that they are actually invisible three yards away.

More perils: The equatorial lowlands, east of the Andes foothills, are infested with swamps where crocodiles lurk and disease is rampant. The Igapo, or flooded forest region, holds far more terrors than the mangrove swamps of Louisiana. And insects—in certain spots, mosquitoes and black flies come in such swarms that they can completely blot out the sky on a sunny day.

But now the bounties. Explorers have only recently learned a remarkable fact: The untouched inland areas, abounding with great prairies, expanses of fine waving grass and fertile soil, give every promise of containing limitless wealth. Earl Parker Hanson, a world traveler and explorer, declares that there are unending sources of rubber, Brazil nuts, tonka beans for perfumes, palm fibers, cashew nuts (the oil of which is important in the plastics industry), and palm oils now in demand because of war-born shortages. There are foods, there is timber, there is untold wealth in the Amazon basin which the world has not yet taken and used.

Tibet, land of mystery, also holds tantalizing puzzles for civilization. There are vast sections in the snow-capped mountains which have never been visited by explorers. And

[*Continued on page* 172]

MI Tests The '52 Buick

[*Continued from page* 83]

everything, especially if you eat the cake, and with Dynaflow there's no fast breaking from a light. The spongy feature that makes Dynaflow so successful in a parade up Broadway is the reason you get a squish instead of a swish when you jump the throttle.

In summing up, the Buick Roadmaster is a truly magnificent luxury wagon. No car on the road is more comfortable. It is as quiet as Saturday night in church and you get the same stable feeling as sitting in a parked Greyhound bus. This balloon will appeal to thousands who like to cruise the super highways or brave the horrors of city traffic in effortless peace. If it happens to be your type of car I can honestly say there is nothing finer. •

Three-Wheel Hot Rod

[*Continued from page* 85]

Happily, the three-wheeler shows no signs of sprouting wings and floating off the road even at high speeds. With its low center of gravity and excellent balance, it zips along as if glued to the ground. There's no sway on fast turns and the car handles extremely well at all speeds.

The judges at recent national auto shows in Washington were so pleased with Harp's hot rod that they awarded him a special prize. Promoters of other automobile shows have offered him $150 and up just to put his sleek dreamboat on display. As a result of such acclaim, Harp is thinking of building a two-seater version to satisfy the yen of other earth-bound young men for a speedy lift in a sky car. •—*Rudy Arnold*

Atmosphere Leaking?

[*Continued from page* 98]

large enough to survive the atmospheric collision and land in the same area upon earth is rare. For this to occur in the same week is even rarer. But when within three weeks nine meteors fell in the Southwest, scientists began to wonder. MI artist Eric Sloane has come up with a possible explanation. Perhaps atomic blasts have torn holes in our atmosphere and made it less effective for meteor destruction. And if so, perhaps some warring dictator of the future may discover a way of dissolving the meteor-bursting blanket over a country and letting the universe bombard it into submission. •

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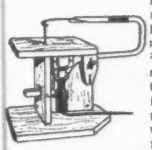

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New Worlds To Conquer

[*Continued from page* 170]

in Tibet may lie one of the world's greatest wonders, still to be discovered.

It is this: Mt. Everest in the Himalayan range is the world's highest mountain peak conquered by man—29,002 feet of towering granite. But persistent rumors have seeped from Tibet that somewhere among the maze of mountains is a grand monarch of a peak higher even than Everest. And not only has it never been climbed by anyone, it has never even been seen by modern man.

Great explorers have been hearing of this elusive mountain for years. Some discount its existence, but many believe. F. Kingdon Ward, who spent years scaling the rugged walls of the Tibetan hills, declares: "If such a peak does exist, we can say with absolute certainty it can only be in Asia and more particularly in Tibet or Western China."

Now turn to geography's greatest unknown—the Antarctic continent. A place of unearthly beauty, majesty and utter desolation, it is the greatest remaining challenge to explorers—5,000,000 square miles of mystery and wonder, the size of the U. S. and Australia combined, but a dead continent where fewer than 1,000 human beings have ever set foot.

The Antarctic continent is surrounded by wind-whipped seas, icy ramparts and almost impassable mountains. In the bays are packs of killer whales which can burst through many feet of solid ice to attack their prey. On the shelves of the ice canyons are the dread leopard seals which spring at anything that moves. Emperor penguins the size of a man and wild skua birds are the other inhabitants.

Right now there is considerable interest in the Antarctic for military reasons. Expeditions from ten nations are either there, on the fringes, or planning to go soon. But nobody has penetrated the rim. What's beyond is still a mystery.

Then, there's Africa. Despite the much publicized big-game hunts, the Hollywood safaris and well-equipped expeditions of museums, the Dark Continent is still wide open for pioneering. In its shadowy interior are stretches the outside world knows nothing about, primitive lands where aborigines dwell in deepest seclusion.

In the north is the arid wilderness of the Libyan Desert, bounded on the east by the Nile River and the west by the thinly settled regions of Ennedi, Erdi and Tibesti. The entire area is about 1,100 miles long and about the same distance north to south.

Is it all dry, empty desert land? Archaeologists suspect that treasures beyond the dreams of man lie hidden somewhere in this great

unexplored sea of sand. They have evidence that a good portion of the region was at one time a fertile, green, lush land, the center of a flourishing culture which probably ended about 2500 B. C. They have found rock paintings and carvings of cattle breeders and hunters. A drawing recently uncovered shows a child playing with a tame ostrich.

Somewhere in the Libyan Desert, experts believe, lies the fabled treasure city of Zensura, which is supposed to contain the enormous stored wealth of a land long since lost to the world. Somewhere are the mummified remains of a lost army, commanded by Shah Cambyses of Persia, which perished there about 500 B. C. The army, history says, was marching on the city of Siwa to sack and destroy it when a sandstorm suddenly wiped out the mighty host.

The Arctic has been much more thoroughly explored than its counterpart in the south. With the realization that a new war may well be fought to a large extent in the north, nations have probed the wastes at a fast clip. America has troops and weather stations, Russia is said to have made great strides in the development of its Arctic zone, other nations are moving.

But there are still wide stretches in Greenland, the northern part of Canada and the glacier country which have not yet been explored. Earl Parker Hanson, the well-known explorer, believes that the north can be developed to its full capacity, with cities, mines, farms, herds and even health resorts.

There is still another unexplored frontier which in many ways is the most mysterious and least touched of all—the ocean floor.

Are there the remains of buried civilizations at the bottom of the ocean? Ever since man started to wonder about his past, that question has been asked.

Are there monsters deep down, adapted by nature to withstand the enormous pressure, beside which the legendary Loch Ness denizen would seem like a tame goldfish? The possibility cannot be discounted because we already know, thanks to the explorations of Dr. William Beebe and other ocean plungers, that weird creatures do exist. A mile below the surface there is total darkness, yet there are dragonfish which have as many as 190 light organs on their bodies and fish which have tentacles taking the place of eyes.

Nothing left to explore? No new worlds to conquer? From the South to North Poles, from Asia to South America, men of courage are pushing into stifling jungle heat, thin-aired mountainous wastes and blistering cold. And as these modern day Magellans fight jungle beasts, howling elements and head-hungry natives, civilization sits back and watches new worlds emerge. •

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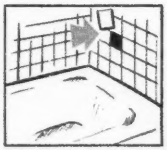
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Toys With Golden Tunes

[*Continued from page* 72]

worth of advertising couldn't have bought. Until then, there had never been a toy industry on the West Coast, the market for such merchandise being largely concentrated in the East. The Handlers, by doing what everyone said couldn't be done and plastering the country with their sensational pianos, caused the name of Mattel to become etched in the minds of the nation's principle toy buyers.

But $30,000 down the drain is still $30,000 in a hole. And the Handlers, as yet unaware of their sudden popularity, began wracking their brains and talents for an item to bail themselves out of the financial doghouse. Then came their next big break in the form of an idea for a simplified music box, proposed by Ted Duncan, a music arranger. At that time, the music-box business was practically monopolized by intricately handcrafted European mechanisms selling for high prices.

Duncan's revolutionary idea revolved around a simplified, hand-cranked mechanism that would bring musical toys into the mass market range by retailing for $1, $2 and $3 each. Putting their collective heads together, they finally worked up the idea into a music-box mechanism that consisted of nothing more than a knob-studded band of rubber stretched around two rotating metal shafts (one of which terminated in a hand crank), and a small zinc harp containing nine stiff wires of graduated lengths. When set in motion by the crank, the endless belt would flick the wires of the harp with its raised tabs and produce a tune that even Petrillo couldn't find fault with.

Here was a music-box mechanism that was so flat it could fit into a space only ½-inch deep making it adaptable to almost any type of toy. It's hand-crank feature would give the kids a feeling of actually playing the music themselves—something a winding mechanism couldn't do. And it lent itself beautifully to mass-production methods.

Throwing his imagination into high gear, Elliot designed a line of musical toys that immediately caught the public fancy by storm. A plastic uke with wire strings and tunable pegs on the outside was fitted internally with a music-box mechanism. Plastic doll cribs, complete with baby dolls, play "Rock-a-Bye

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Baby." Toy pianos became player pianos. A colorful, metal merry-go-round turns and turns by the same crank that plays the tune on the music box hidden in its base. A Western chuck wagon, harnessed with a bouncing donkey and driven by a guitar-strumming cowboy, plays "O Susannah" as it is pulled along the ground, its revolving wheels serving as the crank for the music box built into the wagon's base. A musical Jack-in-the-Box pops out on cue when its "Pop Goes the Weasel" tune reaches the "pop." In this synchronized toy, an extra, non-musical tab on the endless belt trips the box-cover latch at the correct moment.

There are musical hurdy-gurdies with and without dancing monkeys, a Peek-a-Boo musical egg that contains a novel four-sided picture of a dancing rabbit which rotates as the musical mechanism is cranked, giving the illusion of an animated cartoon. The Handlers even made that old nerve-wracking toy, the noise-maker, socially acceptable by putting it to music. They simply replaced its ratchet nerve-grater with their musical rubber band and now when the gadget, dubbed a Twirl-a-Tune, is twirled, it plays any one of a number of soothing nursery melodies. How many ear drums this is destined to save has yet to be estimated.

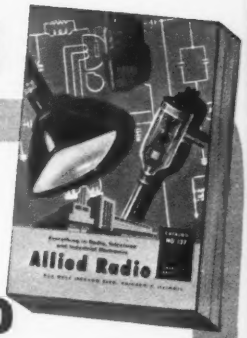
It seems that doing the impossible has become a habit with the Handlers. When they decided to make a musical nursery-rhyme book by gluing paper book covers containing illustrated pages around music boxes, bindery firms said it couldn't be done. So they did it—with machines and jigs designed by Elliot for the purpose. The machines consist of mechanized glue-coated rollers over which the specially-made book covers are passed. Then, coated with glue, they're cemented around cardboard boxes containing the musical mechanism.

Elliot's flair for developing short cuts and special machinery to simplify and pep up production is one of the secrets of his success. For him, the word "impossible" is interpreted as a challenge and any suggestion, however fantastic it may seem, gets serious consideration and sometimes a trial.

Always aiming for originality, Elliot and his crew are working on a new line of toys designed to keep pace with the times. One plan is to put out musical books on Americana that play patriotic tunes. A Twirl-a-Tune, painted like an American flag, plays "America" when waved. Other twirlers will bear resemblances to the flags of the United Nations and play their national anthems.

So, if you should spot a really clever musical toy, turn it over and look at the label. We'll bet the Handlers called the tune. •

FREE



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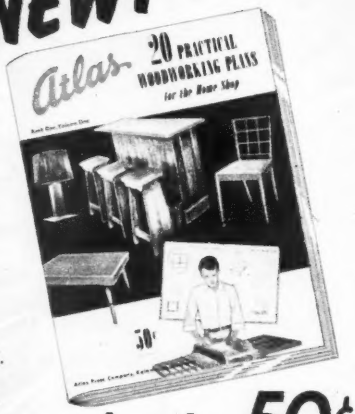

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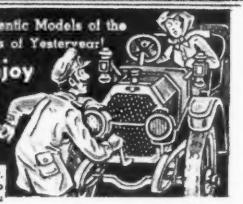

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Landlocked Leapers

[*Continued from page* 94]

this fishing during the early season is the nearest thing to Atlantic salmon fishing I have ever found.

If the landlock enthusiast is a fly fisherman by preference, he must get in his licks early and late for during the warm-water periods these fish must be taken by trolling deep in most New England waters. The lakes of northern Maine seem to provide perfect conditions for these "stranded" salmon and the season is legally open as soon as half the ice has gone out.

In some sections the fly-caster still can practice his craft if he is willing to settle for smaller fish. A few years ago I made a trip to a chain of lakes in Maine for this fishing. We arrived after the ice was out and the water temperature was rising. These lakes were connected by winding streams termed "thoroughfares" and I decided to see if the landlocks were moving from one lake to another.

Early the first morning I headed for one of these thoroughfares. After watching one of the wide, shallow stretches for some time, I was certain I could catch an occasional gleam of a moving fish, so I tied on a small streamer and began working a pool at the foot of this stretch. After an hour of fruitless effort, during which I changed streamers several times, I decided to go down to the foot of the pool and try a dry fly just to see what would happen.

Arriving at the foot of the pool I discovered that I had left the box of dry flies back at the camp but I did have a few "Spiders." They were tied on No. 10 hooks but had tremendous hackles, so I decided to try one anyway. My first cast was a bad one and I began stripping in line hurriedly to make another. As I stripped, the fish hit. The fine leader was not up to the strain. It parted immediately. I was all thumbs in my hurry to tie on another fly.

After a score of casts I had almost reached the conclusion that this had been the only fish in the pool. Then, while retrieving the fly to repair another bad cast, I saw a fish rise and miss the fly. The answer, I decided, was to "skitter" the fly rather than let it drift. I tried this and hooked a two-pounder on the second cast. For some reason those fish would not show the slightest interest in a drifting fly but would strike savagely at one moving rapidly.

The big fish, it must be admitted, are taken by slow trolling and often it is necessary to troll slowly enough to let the fly or bait sink

[*Continued on next page*]

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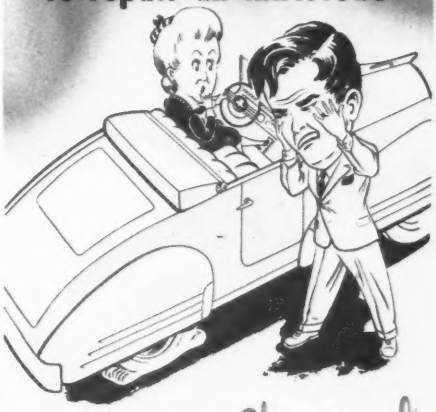

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Landlocked Leapers

[*Continued from previous page*]

well below the surface. In areas where it is difficult to obtain smelt, especially during mid-season, I have had unusually fine reports on the so-called Actual-lure. This is a small shiner encased in a pliable plastic film. Several friends have written me that these lures often provide results when even fresh smelt fail to bring a strike.

The light dry-fly rod is not the best tackle for this sport. While it is possible to take the smaller fish from thoroughfares by means of this wand, the average angler will want something heavier. For the lake fishing, a 4 to 5-ounce, 8½ to 9-foot rod will usually prove more satisfactory. The rod action should be fast rather than soft either for streamer fishing or trolling. Many trollers have turned to the beryllium copper or fiberglass fly rods for trolling and some insist that these rods are satisfactory for casting the large streamers normally used. The reel should be large enough to carry the casting line plus 100 yards of 10-pound-test nylon backing, although for trolling many now prefer to eliminate the heavy casting line and use only 12 to 15-pound-test monofilament, which eliminates the necessity for a leader.

There are several flies or streamers favored in various areas and popular patterns include: Brown-and-White Bucktail, Edson Tiger, Warden's Worry, Red-and-White Optic Bucktail, Gray Ghost, Black Ghost, York's Kennebago, White Marabou and Mickey Finn. In addition, there are a number of specials tied at the various camps located on popular landlock waters. Some anglers insist that the use of a double hook often saves fish that otherwise would be lost, especially when they are striking the bait only half-heartedly.

Those who praise brook and rainbow trout as food will find no words to describe the flavor of landlocks. They are equal in flavor to the salmon, although often lack the color of the flesh. When steaked, baked, or boiled and served cold with mayonnaise, they have a really rare flavor. But as with all fish, this flavor is doubled when they are prepared over an open fire on the rim of a lake shortly after they leave the water.

The fish and game departments of Vermont, Maine, New Hampshire and Quebec can provide a list of waters where this fish can be found and most of the camps located on these waters are inexpensive. However, those planning to make their first trip during the ice-out period should waste no time in making a decision and a reservation, for once the ice begins to break up the rush is on. •

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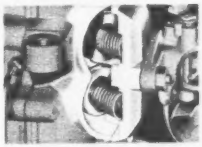

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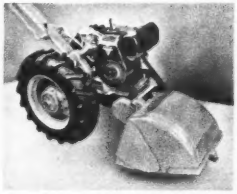

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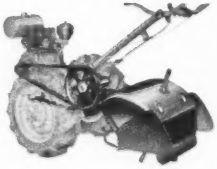

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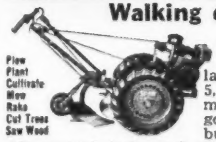

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It's A Looney Moon

[*Continued from page* 78]

But, it was a little while after that a stocky, middle-aged man was seen dashing away after setting fire to a baby carriage in a tenement hallway. A passerby pounced upon him and held him until police arrived. It was the famous Bronx pyromaniac, who finally admitted to Mr. Brophy that he had put the torch to the 40 buildings, to many of them when the moon was big and round—and full.

Is all this just fascinating folklore or is there any scientific basis for believing that the moon may have a potent effect on us? Let's go back to the Duke experiments.

Dr. Leonard J. Ravitz, a neuropsychiatrist at Duke Medical College who has spent much of his career studying the moon's effect on man, set out to find an answer.

He carefully selected a small group of human subjects, consisting of men and women who fell into three catagories. The first consisted of seriously maladjusted people who frequently behaved in an irrational manner, the second group was moderately well adjusted and the third reasonably well adjusted.

Now scientists have long known that each of us, like a battery, gives off electrical waves. These electrical potentials can be measured by a highly sensitive instrument known as a microvoltmeter. Dr. Ravitz set about a detailed study of the human electricity generated by his subjects.

He made daily measurements and, at the same time, he had the volunteers give him a graphic, daily account of their moods and problems, just how they felt emotionally every step of the way. At the end of an eight-month testing period, Dr. Ravitz read his findings. There were sharp individual variations here and there but there was one amazing sameness which ran throughout:

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[*Continued on page* 185]

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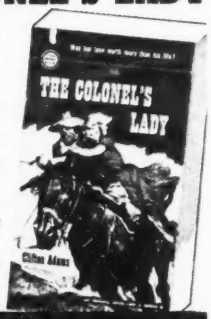

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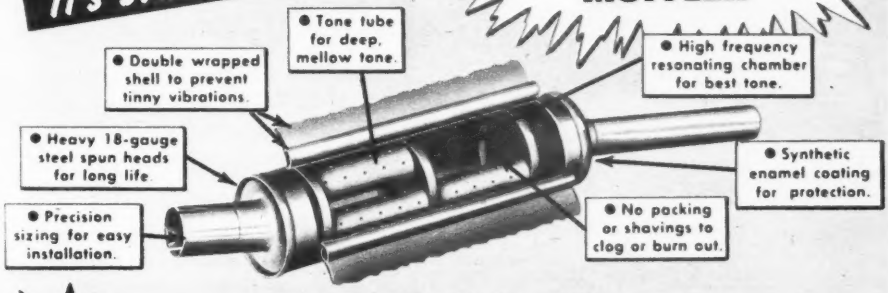

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It's A Looney Moon

[*Continued from page* 181]

In another phase of his experiments, Dr. Ravitz measured the electrical output of insane persons, plotted the day-to-day results and found marked changes coinciding with the moon's shift. He learned that the most severely ill mental patients were much worse at the time of the new or full moons. He measured one patient for five months and on the basis of the results made a mathematical prediction of his behavior for the rest of the year. The results were almost exactly as foretold!

And finally, Dr. Ravitz closely watched the patients in the psychiatric wards at Duke Hospital and the Veterans Hospital in Roanoke, Va. He found that there was, in general, considerably more unrest during the new or full moons than at any other period.

In reporting what he found, Dr. Ravitz declared the tests showed all human beings are affected by universally present forces such as the moon's cycle. "Experimental evidence," he said, "supports the theory that whatever else we may be, we are all electrical machines. These energy reserves may be mobilized by periodic universal factors (such as the moon) which tend to aggravate maladjustments and conflicts already present."

Dr. Ravitz himself admits that "infinitely more work" remains to be done before his findings can be accepted as a valid hypothesis. But doctors and scientists are excited by his discoveries. The average citizen should be, too, because of the enormous possibilities.

What could it mean to you? Simply this: Through microvoltmeter readings, you actually may be able to predict your own moods weeks and months ahead. Dr. Ravitz points this out: "It may be," he declares, "that eventually we may be able to predict our own mood cycles from such microvoltmeter readings, for we did find in our experiments periods in which the subjects were going to feel best and others in which they will be less emotionally stable." As proof, Dr. Ravitz himself found that he could pretty well forecast how he was going to feel emotionally from his own readings.

Just imagine. If you are planning a ticklish business venture which would require all your concentrative faculties, you would be able to schedule your most intensive mental planning for a time when you know you would be most free from emotional disturbances.

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[*Continued on page* 187]

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It's A Looney Moon

[*Continued from page* 185]

client, make a pitch for a big new job, go anywhere or do anything which would require your clearest head and sharpest thinking, you would be able to pick the time when you could give your mental best.

Even though scientific experimentation is being carried on, most belief in the power of the moon is based on pure superstition.

But what are the facts? Well, W. L. McAtee, technical advisor of the U. S. Fish and Wildlife Service, declares "there is considerable evidence of lunar influence upon organisms." He points out that the Hawaiian palolo and the California grunion spawn by the moon's phases, as does a type of seaworm in the South Pacific. Morea flowers, he says, which are South African members of the iris family, bloom by the moon's changes.

Everyone knows that the gravitational action of the moon produces tides in the oceans. The sun also creates tides but they are far weaker than moon-made ones because of the much greater distance from the earth. Strongest tides are produced when the sun and moon are in a line on the same side of the earth and they are weakest when they are in opposite positions.

For many years, copies of the Solunar Tables have been as important a part of anglers' gear as their rods and reels. It is a theory of fishing involving the moon, developed by John Alden Knight, the nationally known authority on angling. Many years ago, Knight learned that commercial fishermen and hunters in Georgia and Florida planned their excursions according to the "moon up" and "moon down" theory. That is, they had discovered their catches were more bountiful when the moon was either directly overhead or directly underneath. This started Knight on an intensive study of the moon, tides, feeding habits of fish, solar forces, fresh-water fish versus the saltwater variety and he ultimately came up with a startling theory that goes like this:

The time at which the conditions which cause ocean tides (that is, the pull of sun and moon) pass the longitudinal meridian of any given point is the Solunar period at that point. And, if other conditions are favorable, fresh-water fish tend to feed more readily during these Solunar periods than at other times.

So, there's the moon shining big and bright in the sky. Looks innocent way up there, doesn't it? Well, don't be fooled. That great ball may be a more important factor in your life and in the workings of this world than you ever thought. •

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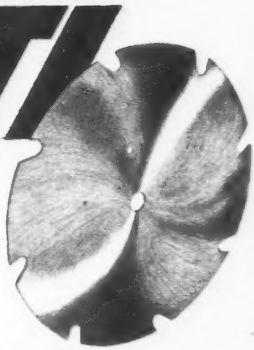

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I'm A Rabbit Butcher

[*Continued from page* 90]

about 40 rabbits each year. I use one buck for every ten does and rotate them, besides bringing in new strains to improve the herd and maintain production. At present I have about 600 breeders.

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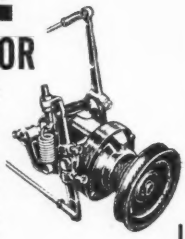

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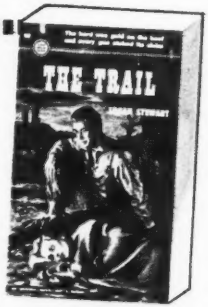

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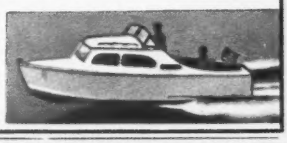

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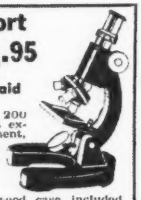

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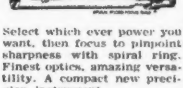

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Telescope Maker's Page

[*Continued from page* 150]

see the satellites of Jupiter and the mountain ranges in the moon.

The main body of the telescope consists of an aluminum tube 26 in. long. One end of this tube houses the objective lens and the other end contains the adapter for the eyepiece. Because Mr. Palanek is a machinist by trade, he chose to thread the eyepiece adapter with a ⅛ in. square thread for focusing. If you do not have access to a lathe, an alternate method of construction is shown in the lower left hand corner of the drawing. The only thing at all critical in the construction of this telescope is the distance between the eyepiece and the objective lens. However, correct placement of the lenses can be determined by a simple test. Place the objective in the sun so that it projects the sharpest possible image of the sun on a white card. Measure carefully the distance from the center of the lens to the image of the sun on the white card. This is the exact focal length of the lens and it determines the length of the large tube. The eyepiece should be mounted in such a way so that a point ¼ in. from the field lens (the larger lens of the two comprising the eyepiece) is at this focal point. In making the eyepiece adapter, provision should be made so that the eyepiece can slide or screw inwards at least ¼ in. from this point and at least 1½ in. outwards.

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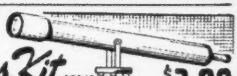

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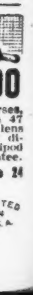

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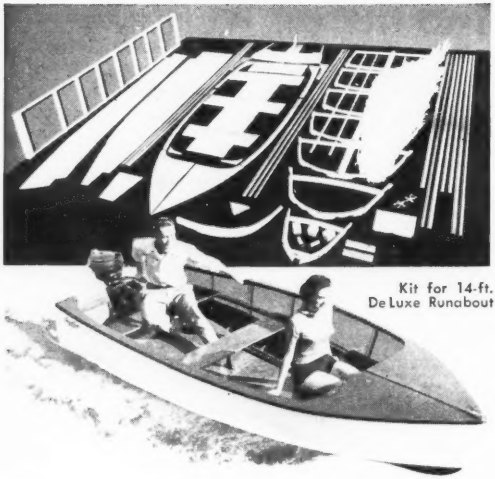

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